KANEKTOK RIVER COUNTING TOWER COOPERATIVE PROJECT, 1997

By

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and

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ABSTRACT

Abundance, age, sex, and length data were summarized for 1997 Kanektok River spawning escapements of Pacific salmon *Oncorhynchus* as part of an effort to collect baseline information. The Kanektok River counting tower is operated as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Native Village of Kwinhagak (NVK). The crew were primarily lifelong residents of the area with extensive commercial and subsistence fishing experience which enhanced the project operations.

In 1997 the counting tower estimated escapement passing at approximately river mile 7 of the Kanektok River. Five species of salmon were enumerated, chinook or Taryaqvak (Yup'ik name) *O. tshawytscha*, sockeye or Sayak *O. nerka*, chum or Kangitneq *O. keta*, pink or Amaqaayak *O. gorbuscha*, coho or Qakiiyaq *O. kisutch*. The estimated escapement was 16,743 chinook, 96,528 sockeye, 51,204 chum, 7,894 pink, and 23,172 coho salmon. The midpoints of the run past the tower for chinook, sockeye and chum salmon were estimated to be 5, 7, and 11 July, respectively. Passage by the counting tower was highest in the evening hours and lowest in the early morning hours, after 0400 hours, for all salmon observed. Run timing from the commercial fishing district to the tower was estimated to be approximately five days for sockeye, chum and coho salmon. Age-1.2 and -1.4 chinook, age-1.3 sockeye, and age-0.4 chum salmon were the largest returning age groups by species.

The reliability of species identification from the tower was a concern in 1997. Even with the optimal water clarity, allowed by the unusual dry summer, there was difficulty in distinguishing salmon by species where spawning coloration was not apparent. The ability to correctly identify salmon species from the towers will be even more challenging under normal weather patterns of western Alaska. A solution to this long-term problem, proposed by some of the co-operative project members, has been to use a floating weir instead of a tower; however, the Native Village of Kwinhagak was supportive of the tower project at the time of 1997 field season.

KEY WORDS: Kanektok River, Pacific salmon, Taryaqvak, Sayak, Kangitneq, Amaqaayak, Qakiiyaq, *Oncorhynchus*, *tshawytscha*, *nerka*, *keta*, *gorbuscha*, *kisutch*, escapement, run timing, age composition, floating weir

INTRODUCTION

The Kanektok River is a clear water stream, in southwestern Alaska, draining from the Ahklun and Eek mountains into Kuskokwim Bay (Figure 1). The river is some 90 miles in length from its source in Kagati Lake to its mouth, adjacent to the village of Quinhagak (Figure 2). Most of the drainage is within the Togiak National Wildlife Refuge. The Kanektok River, known locally as the *Qanirtuuq* River, supports commercial, sport, and subsistence harvests of five species of Pacific salmon: chinook or "king" salmon *Oncorhynchus tshawytscha*, sockeye or "red" salmon *O. nerka*, chum or "dog" salmon *O. keta*, pink or "humpy" salmon *O. gorbuscha*, and coho or "silver" salmon *O. kisutch*. The five species of salmon are known locally as Taryaqvak (chinook), Sayak (sockeye), Kangitneq (chum), Amaqaayak (pink), and Qakiiyaq (coho). In addition, subsistence and sport fisheries in the Kanektok River harvest rainbow trout or Talaariq *O. mykiss*, Dolly Varden or Iqallugpik *Salvelinus malma*, Arctic grayling or Culugpauk *Thymallus arcticus*, and whitefish or Imarpinraq *Coregonus spp.*

Commercial fishing in Kuskokwim Bay occurred very sporadically from at least 1913 to 1951 (Pennoyer et al. 1965). The present day commercial fishery in Kuskokwim Bay, adjacent to the village of Quinhagak (District 4), was established in 1960. The commercial fishery continued to be quite sporadic until 1968 when the fishery became more stable due to increased availability of buyers (ADF&G 1968). Since its inception the District 4 commercial fishery continues to be a major source of income for the residents of Quinhagak.

In 1960, the Alaska Department of Fish and Game (ADF&G) established a counting tower project on the lower Kanektok River, a few miles upriver from Quinhagak (ADF&G 1960). This location did not prove satisfactory because of poor visibility into the water column, difficulties with species identification, and logistical problems. In 1961 and 1962, ADF&G located the counting tower at the outlet of Kagati Lake to obtain an accurate enumeration of the sockeye salmon utilizing this lake for spawning (ADF&G 1961 and 1962). Although the tower at Kagati Lake provided useful escapement information, the project was abandoned after 1962. Until the early 1980s, the only enumeration method used for quantifying escapements in the Kanektok River was aerial surveys (Table 18). From 1982 through 1987 ADF&G attempted to enumerate salmon through use of sonar on the lower Kanektok River (Schultz and Carey 1982, Schultz and Williams 1984, Huttunen 1984, 1985, 1986, and 1988). Due to site limitations, technical obstacles, and budget constraints the sonar project was discontinued after 1987.

In the late 1980s and early 1990s, the number of permit holders participating in Kuskokwim Bay began to steadily increase with a peak of 409 permits fished in 1993 (Appendix D.2.). Also, in the mid-1980s, the residents of Quinhagak expressed concerns over the increasing numbers of sport fishers on the Kanektok River. Given the growing demands on the salmon populations, aerial surveys were deemed insufficient for management of the District 4 (Quinhagak) commercial fishery. The increasing fishing effort and the lack of escapement data, other than aerial surveys, for the Kanektok River was of paramount concern to the Quinhagak I. R. A. (Indian Reorganization Act) Council, United States Fish and Wildlife Service (USFWS), and ADF&G (Fox 1996). To address this lack of escapement data, a counting tower project was established on the lower Kanektok River in 1996. This project was a result of a cooperative effort between the Native Village of Kwinhagak (NVK), USFWS, ADF&G, Association of Village Council Presidents (AVCP), and Bering Sea Fishermen's Association (BSFA). Because of logistical difficulties and weather problems in 1996, salmon were enumerated for only 16 days at the tower site. In 1997, a more comprehensive counting schedule was initiated and along with favorable weather conditions the counting tower crew was able to enumerate salmon for 71 days.

METHODS

Escapement Enumeration

Enumeration of salmon escapement on the Kanektok River took place approximately seven river miles (11 km) from the coast. Escapements of salmon were estimated by use of counting towers. The crew were primarily lifelong residents of the area with extensive commercial and subsistence fishing experience which enhanced the project operations.

Salmon counts began on 11 June and terminated on 21 August. A partial weir was constructed to aid in the counting tower operation by reducing the width of the river channel where fish could pass. During the observational period the river width was approximately 180 feet (59 m) at the tower site. The weir extended into the river from the left bank for 58 feet (18 m). The weir was extended on 27 June another 22 feet (7.2 m) and for the remainder of the observational period the width of the river channel between the two towers was 97 feet (31.8 m). White vinyl "flash panels" approximately one meter feet wide were laid across the river channel to provide a background to assist in the identification of salmon species. The midpoint of the counting area was marked by an iron bar, laid across the flash panel, to determine which salmon were to be counted each by respective bank. Observers wore polarized sunglasses during daylight hours to reduce glare. One or two 150 watt spotlights were used from each tower during twilight and darkness to illuminate the counting area.

The left bank tower was located on the end of the weir and the counting platform was approximately 10 feet (3.3 m) above the water surface. The water depth at the end of the weir, measured on 30 June, was approximately 7 feet (2.3 m). The height of the right bank tower platform above the ground was 21 feet (6.9 m). The right bank tower was 10.5 feet (3.4 m) back from the cut bank that dropped approximately 5.5 feet (1.8 m) to the water surface (measurement to water surface taken on 30 June). In mid-July a second platform was placed at the 12-foot-level (3.9 m) on the right bank tower. The crew noticed that counting at the 12-foot height often provided a better angle to see the sides of the salmon, which aided in species identification. Depending on weather and water conditions the crew used either the 12-foot or 21-foot height platform on the right bank for counting.

A systematic sampling design was used where salmon were enumerated for 10 minutes every hour, every day on both river banks. During one week in late June and early July only one tower was used to enumerate salmon in the entire river channel and a count of 20 minutes was made every hour. Each count was the net upstream movement of each salmon species. The observer used a hand-held tally counter to record the upstream and downstream movement of salmon. Digital timers with alarms were used to provide accurate sampling time. As standardization, each hour's count began on the left bank (facing downstream), followed by a count on the right bank. A systematic sample was used in that every hour the left bank count began at the start of the hour. The right bank count immediately followed the left bank count, except in cases when beach seining of salmon for age, sex and length (ASL) information was in progress. In this case, to efficiently maximize crew time one person would go to each tower and make the 10 minute count at the start of the hour. Each 10-min or 20-min count was expanded into an hourly estimate to calculate the total daily escapement. For example, a 10-min count would be multiplied by 6 and a 20-min count multiplied by 3 for an hourly escapement estimate.

One of the assumptions of the abundance estimate is that the passage rate during a sampling period is an accurate (non-biased) estimate of the passage rate during the remainder of the hour. The validity of this

assumption was investigated in a qualitative manner by conducting several hour long counts during the season (Appendix B.2). During the hour long count the observer would record the number and species of salmon passing every 10 minutes. The actual number of salmon counted, for the entire hour, was then compared with the estimate for that hour, by calculating the relative bias. The small sample size precludes drawing any conclusions, but the method may be used in future years to examine assumptions of the estimate.

Age, Sex, and Length Estimation

Escapement sampling was conducted based on a pulse sampling design (Molyneaux and DuBois 1996). Most sampling effort was focused on chinook, sockeye and chum salmon, however a limited number of coho salmon were also sampled. The sample size goal for each pulse of each sample was 200 fish per species. Each pulse sample was used to estimate ASL composition of the run for a given temporal strata (4 to 23 days). A weighted mean, with fish passage during each defined strata as the weights, was used to estimate age composition of the total season passage.

Reference is made in this report to the estimated ASL composition of the District 4 (Quinhagak) commercial catch. Details on the procedures used to derive these estimates are described by Molyneaux and DuBois (1996). Of particular interest, however, is that the sex of each fish in the commercial catch sample was confirmed by visually inspecting the gonads.

A 100 ft (32.8 m), 3 in (7.6 cm) mesh and a 150 ft (49.2 m), 2 in (5.1 cm) mesh beach seine were used to obtain salmon for age-sex-length (ASL) information. Sampling was done between 10 to 250 meters downriver from the counting towers. For each individual beach seine set attempted, the location, time, and number of all species caught was recorded. The seine was towed behind a boat encircling the salmon. The salmon were placed in a wire enclosed "live box" approximately one meter by two meter. After salmon were sampled for ASL data their adipose fin was clipped to avoid resampling and they were released alive into the river.

Scales were collected from the left side of the fish approximately two rows above the lateral line in the area crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (INPFC 1963). Scales were mounted on gum cards and impressions made on cellulose acetate cards with a heated hydraulic press (Clutter and Whitesel 1956). Salmon were measured to the nearest millimeter from the middle of the eye to the fork of the tail. The sex of each fish was determined from external characteristics.

Ages for salmon were determined by examining scales (Mosher 1968). European notation (e.g., 2.2; Koo 1962) was used to record ages: numerals preceding the decimal refer to number of freshwater annuli and numerals following the decimal refer to number of marine annuli. Total age from time of egg deposition or brood year is the sum of these numbers plus one.

RESULTS

Salmon counts began on 11 June and terminated on 21 August. The total estimate for salmon escapement during the operational period was 16,743 chinook salmon, 96,528 sockeye salmon, 51,204 chum salmon, 7,894 pink salmon, 23,172 coho salmon, and 5,232 salmon of unknown species (Table 1 and Figures 16 - 20).

Salmon caught with beach seines fished near the tower site were used to estimate the ASL composition of the escapement. A total of 153 sets captured 96 chinook, 902 sockeye, 1,457 chum, 352 pink, and 363 coho salmon. Respectively, 92, 865, 1,152, 0, and 363 of these fish were sampled for ASL information and fin-clipped prior to release. Over the course of the season 124 chum, 85 sockeye, and 23 coho salmon were recaptured as identified by fin-clips. These fish were released without additional sampling.

A total of 1,476 Dolly Varden, 32 whitefish, and 5 rainbow trout were also captured in the beach seine sets (Tables 4 and 5). These species were released without sampling or being fin-clipped.

DISCUSSION

Escapement Enumeration

At project initiation, two towers were used and ten minute counts were made on each bank (Appendices A.1 - A.12). On 27 June, after the weir was extended, only the right bank tower was used and salmon passage in the entire river channel was counted for 20 minutes each hour, 24 hours a day. The one-tower method allowed for a longer counting period for the entire river channel, however, species identification became more difficult. For example, for schools of fish passing near the right bank it was easier to recognize the various salmon species, but if the schools crossed near the weir it was difficult to distinguish between smaller chinook, sockeye, and chum salmon. Over 40% of the unknown counts (salmon, but species unknown) occurred during the week when only one tower was used. Because of the problems with species identification, when using only one tower, the crew reverted to the two-tower system on 3 July, and counts were made from two towers for the remainder of the season.

The reliability of counting was influenced by various factors during the season. Periodically, poor visibility due to overcast skies, turbid water, river surface disturbances, and glare resulted in suspected counting errors. The spotlights used to increase visibility at night may have resulted in avoidance reactions by the fish. The spotlights were on only when counting was occurring. Because fish may also have been avoiding the white panels, it was difficult to visually assess the effect of the lights on fish behavior. Several times during the season an observer would watch salmon movement before and after the lights were turned off and a change in salmon behavior was not visually detected (nonstatistical comparison, NSC).

The total estimate for salmon escapement did not include estimates of passage before counting was initiated or terminated. Chinook salmon were already passing the tower site in small numbers when counting began and the project was terminated before the pink and coho runs had passed. Also, there were occasional gaps in the counts where interpolations were not used to estimate missing data. For example, on 12 through 14 June, counts were suspended for 42 hours while the crew addressed other concerns. Salmon passage was slow before and after this period and no estimates were made as passage was assumed to be negligible. In another example, an average of only 15.5 hours per day were counted, from 19 through 27 July, as a result

of a counting shift being excluded due to problems in the data collection procedures. The excluded counts tended to occur in blocks of up to eight hours during the same time period each day. Because the period missed was so large, and because the diurnal pattern of fish passage changed throughout the season, an accurate assessment of salmon passage by interpolation was not possible. Also, the final escapement estimate did not include assignment of the unknown salmon (5,323) to any particular species.

The biological escapement goals (BEG) for aerial survey indices at peak spawning established for chinook, sockeye and chum salmon in the Kanektok River are 5,000, 15,000, and 30,500 fish respectively. Few aerial surveys have been done during coho salmon spawning and no BEG has been established. The two Kanektok River surveys in 1997 were flown after peak spawning. The first survey was flown on 2 August, under poor to fair conditions, and the count included 7,990 chinook, 27,100 sockeye, and 3,270 chum salmon. The second survey was flown on 1 October, under excellent conditions, and the count included 19,595 sockeye, and 5,192 coho salmon. All sockeye salmon observed in the second survey were spawning on the north shore of Kagati Lake.

Seasonal Run Timing

Run timing of salmon species was examined both for the counting season and within a 24-hour period. Also, the run timing between the commercial fishing district and the tower was estimated for some species by examining the catch and tower passage during the season. Chinook, sockeye and chum salmon runs were essentially complete by the time the project was terminated so a seasonal run timing curve past the tower could be developed. No seasonal run timing curves were attempted for pink salmon because of uncertainty in the passage estimates for that species. Passage estimates for coho salmon were incomplete, which also precludes any estimate of run timing.

The midpoints (50%) of the run, past the tower, for chinook, sockeye, and chum salmon occurred within one week, from 5 to 11 July (Figure 3). If the hours where counts were missed, and no interpolation was applied, (19 July until 27 July) were similar to the days preceding and following the missed counts, the midpoints would have been advanced by only one day. The midpoint of 1997 may be compared with the two years that the sonar project was operated during the major portion of the run for these three species. In 1984 the sonar project counted from 15 June through 1 August and in 1985 from 18 June through 31 July (Appendix F.4 - F.5). The midpoints of the run for chinook, sockeye and chum salmon were from 5 to 14 July in 1984 and from 7 to 21 July in 1985 (Huttunen 1984 and 1985). However, comparisons between sonar and tower counts may not necessarily be valid as sonar counts were apportioned by species catch in test nets.

Seasonal run timing of chinook salmon showed that the midpoint of the run occurred on 5 July (Table 2). Between 27 June and 13 July, the central 50% of the run was estimated to have passed the counting tower. The midpoints of the chinook run in 1984 and 1985 were 5 and 7 July, respectively.

The midpoint of the sockeye salmon run occurred on 7 July (Table 2). Between 2 and 16 July, the central 50% of the run was estimated to have passed the counting tower. The midpoints of the sockeye run in 1984 and 1985 were 6 and 11 July, respectively.

The midpoint of the chum salmon run occurred on 11 July (Table 2). Between 2 and 20 July, the central 50% of the run was estimated to have passed the counting tower. The midpoints of the chum run in 1984 and 1985 were 14 and 21 July, respectively.

No seasonal run timing could be determined because of suspected speciation problems with pink salmon and Dolly Varden. Also, no seasonal run timing could be established for coho salmon, but the run appeared to be nearing peak passage past the tower as the highest one day count occurred the day before counting was terminated because of high water and debris.

Daily Run Timing

Salmon species passage by hour was plotted for the season, as well as various periods in the counting project. The average salmon count for a particular hour was determined by adding the actual number of salmon counted (unexpanded) and dividing by the number of counts made at that hour throughout the particular time period (Appendix A.1 - A.12). Expanded counts were not used because of the different counting methods (10 min vs. 20 min) during the project. Therefore, in Figure 4, the average midnight count (0000 hours) for the entire season was about one chinook and ten sockeye salmon. During the week of peak salmon passage (Figure 8), 30 June to 6 July, average actual counts of chinook, sockeye and chum salmon at 1800 were approximately 5, 70, and 22 fish, respectively. The lowest salmon passage generally occurred between 0500 and 1200 hours, although the hours varied slightly by species.

Chinook Salmon. The hourly passage of chinook salmon, averaged for the season, showed the highest passage in the afternoon and the lowest passage between 0600 and 1000 (Figure 4). During the first week of July, passage of chinook salmon in the early afternoon hours of 1300 to 1800 hours was over four times the passage in the early morning hours of 0100 to 0600 hours (Figure 8). In both June and July this same pattern, of much higher passage in the afternoon than in the morning, was observed (Figures 7 - 10). The passage of chinook salmon usually began to decrease after the 2100 count on most days.

Sockeye Salmon. Sockeye salmon showed the same hourly pattern as chinook salmon with higher passage in the afternoon than in the morning (Figure 4). Throughout most of the sockeye run the lowest counts were between 0500 and 1100 hours, and sockeye passage often showed a noticeable increase at the noon count. The drop-off in sockeye passage in the evening was usually later than chinook salmon and was often seen at the 0100 count. During the peak passage week of 30 June through 6 July the late afternoon and evening counts were usually over four times the counts between 0500 and 1100 hours (Figure 8).

Chum Salmon. As with chinook and sockeye salmon the highest hourly passages for chum salmon occurred in the afternoon and evening hours (Figure 5). The lowest passage throughout the season tended to be during the counts from 0500 through 0900 hours. During the first week of July the lowest counts were from 0300 through 0900 hours and the highest counts were usually from 1200 through 2300 hours (Figure 8). The evening counts during this week usually were four times the morning counts. Throughout much of the season the counts after midnight usually decreased and the counts began to increase at 1000 or 1100 hours.

Pink Salmon. The average hourly counts for pink salmon were plotted for the season passage from 6 July to 21 August and overall it does show average hour counts to be lower in the morning than in the afternoon and evening (Figure 6).

Coho Salmon. The average hourly passage of coho salmon was plotted for the season passage from 28 July to 21 August. Similar to other salmon species the coho salmon passage was lowest in the morning and highest in the evening (Figures 5 and 11).

Run Timing from Commercial Fishery to Tower

The run timing for sockeye, chum and coho salmon, between the commercial fishing district and the tower site, appeared to lag four to five days. Because gillnets are known to be size selective, comparisons between run timing at the tower and in the commercial fishery are only speculative in nature. However, in estimating the run timing for both sockeye and chum salmon it was assumed that there was no gillnet selectivity between species, due to their similar size, and the majority of the catch was of Kanektok River origin. Also, aerial surveys and observations by the crew suggest no sockeye salmon and only a small percentage of chinook and chum salmon spawn below the tower site. Local fishermen have also observed coho salmon spawning below the tower site.

Chinook Salmon. By the first three periods in the commercial district, which were 13, 16 and 19 June, over 19,000 chinook salmon were harvested. The catch of the first three periods was over 50% of the season's chinook salmon harvest. By the 23 June opener the chinook salmon catch had dropped nearly in half compared to the previous week. However, the counts at the tower showed chinook salmon to be gradually building in June and peaking on 5 and 6 July. Therefore, the time between the peak in the commercial fishery and the peak passage days at the tower is over two weeks. In comparison, the lag timing of sockeye and chum salmon was estimated at four or five days (see below). It seems unusual that the midpoint of the chinook salmon run past the tower occurred on 5 July, weeks after the peak catches in the fishery. However, this same pattern was seen in 1984 and 1985 with the midpoint of the chinook run occurring at the sonar site on 5 and 7 July, respectively, which also was weeks after the peak catches in the commercial fishery (Huttunen 1984 and 1985).

This discrepancy between what was caught in the commercial fishing district and what was passing at the tower could be the result of the chinook salmon holding for long periods in the lower river or outside the mouth. Chinook salmon may not move, into the Kanektok River, in larger numbers until a greater number of sockeye and chum salmon are also moving into the river. This would help to explain the lower daily percentage of chinook salmon moving past the tower when there are large numbers being caught in the commercial fishing district. To confirm the milling hypothesis a tagging study would be needed.

During the 13 and 16 June commercial fishing periods the chinook salmon catch was over 90% of the harvest of all salmon species. However, the passage of chinook salmon at the tower from 14 June to 20 June was, except for one day, well below 50% of all salmon species. Likewise, the commercial catch for the third and fourth periods (19 and 23 June) still had a majority of chinook salmon in the harvest, but the tower counts of chinook salmon from 21 to 26 June comprised less than one-third of the total salmon counted each day.

There may also be the possibility of gillnet selectivity (fish size relative to gillnet mesh size) for chinook salmon over sockeye and chum salmon. However, the commercial gillnets are 6-in (15.2 cm) mesh or less, and this would not be very selective for the larger six-year-old chinook salmon which because of their size would be the easiest salmon to observe from the tower. Another possibility is that the chinook salmon were being misidentified at the tower early in the run before spawning coloration became prevalent. Few small chinook salmon were observed from the tower during the month of June. Finally, there is also the possibility that some of the chinook salmon caught in the commercial fishery are bound for drainages other than the Kanektok River.

Sockeye Salmon. There appeared to be a correlation between the sockeye catch in the commercial fishery and run timing past the tower. The catch per unit of effort (CPUE) of sockeye salmon in the fishery almost tripled on 30 June compared to the previous opening (Appendix D.1). The CPUE is determined by taking the catch and dividing it by the product of the permit-hours (the number of permits fished multiplied by the number of hours in the fishing period). On the following commercial period (2 July), the highest one day catch of sockeye salmon occurred. Likewise, at the tower there was a large increase in fish passage on 5 July and the peak passage day of the season was on 6 July. The lag time between the increased catches on 30 June and the increase in passage at the tower was five days and the lag time between the peak harvest and peak passage at the tower was four days.

Another possible correlation of the run timing between the fishing district and the tower was seen with the low fishing effort that occurred on 14 July and the increase in tower counts that occurred five days later on 19 July. Although only 16 hours of counts were done on 19 July, the estimated passage of sockeye salmon is the largest daily escapement after 12 July (Table 1). This comparison between the low fishing effort and higher tower passage is believed to be a compensatory effect, but would require further examples, and is only speculative in nature.

There was also a possible correlation observed by the passage of sockeye salmon in relation to chum salmon. On the 21 July commercial opener the chum catch surpassed the sockeye catch for the first time in the 1997 season. Five days later the daily escapement of chum salmon surpassed sockeye salmon. For the remainder of the season the chum catch and daily escapement counts exceeded the sockeye catch and daily escapement counts.

The midpoint of the cumulative sockeye catch occurred during the 4 July opener. The midpoint of the cumulative sockeye passage at the tower was on 7 July. Considering that the missed counts in late July may have resulted in the midpoint of the escapement occurring a day later, and that the previous commercial opener to 4 July was two days earlier, the five day lag estimate for sockeye salmon appears to be a good approximation in 1997.

Chum Salmon. There appeared to be a correlation between the chum catch in the commercial fishery and run timing past the tower, but it was not as strong as the observed correlation of sockeye salmon (NSC). The CPUE of chum salmon in the fishery increased noticeably with the 7 July opener and the highest catch of the season was two days later. At the tower there was an increase in chum passage on 11 July, and the 12 July estimated daily escapement was the second highest of the season. Also, the same possible compensatory effect observed in sockeye salmon may have occurred with chums as five days after the low fishing effort of 14 July, the highest daily passage of chum salmon was observed at the tower (Table 1).

The midpoint of the cumulative chum catch occurred during the 9 July opener. The midpoint of the cumulative chum salmon estimate past the tower was on 11 July. Considering that the counts missed in late July may have resulted in the midpoint of the escapement occurring a day later, and that the previous commercial opener to 4 July was two days earlier, a four or five day lag from the commercial fishing district to the tower appears to be a good estimate for chum salmon in 1997.

Coho Salmon. The same run timing correlation seen with sockeye and chum salmon occurred for coho salmon (NSC). The 4 August coho salmon catch was a fivefold increase over the previous commercial opener on 1 August. Five days later the coho salmon passage at the tower increased by approximately fourfold over the previous days passage.

Coho salmon catch on 1 August surpassed the sockeye salmon catch and three days later, on 4 August, the daily coho count surpassed the sockeye count at the tower. The coho salmon catch on 4 August surpassed the catch of all other species and the coho salmon passage at the tower surpassed all species on 9 August (Table 1).

Although the above discussion indicates a possible correlation between the coho salmon catch and passage at the tower, there may be other variables involved in the movement of coho salmon. Coho salmon passage has been observed to increase at other escapement projects in the Kuskokwim Area during times of higher water levels. Also, coho salmon movement occurs in pulses much more than either sockeye or chum salmon at Kuskokwim Area escapement projects. Therefore, some of the timing of the coho passage may have been effected by the increased water levels that occurred in August from increased precipitation.

Species Identification

The speciation of salmon can be difficult on the lower Kanektok River. The counting site is near the ocean and fish moving past the tower often do not exhibit obvious spawning coloration that is exhibited farther upriver or later in the season. When only one tower was in operation an observer who spotted salmon moving next to the weir would have to speciate that salmon from a distance of over 120 feet. This can be problematic under ideal conditions and nearly impossible during inclement weather. When two towers were in operation the number of unknown salmon were lower, but misidentification of salmon species likely continued as a function of counting conditions and spawning coloration. The biggest problems were believed to be with speciating smaller chinook, sockeye, and chum salmon during the month of June and speciating between sockeye and coho salmon in late July and early August. Also, Dolly Varden were believed to be misidentified as pink salmon. In June most of the salmon passing the tower did not exhibit spawning coloration, making speciation more difficult. In late July incoming coho salmon did not show spawning coloration and were most likely misidentified as sockeye salmon.

There may also be differences in speciation by observers. In an effort to examine observer differences in speciation, 25 counts were done by two observers over a seven week period (Appendix B.1). As a baseline, one counter, the ADF&G technical advisor for the Kanektok River tower, was used for all 25 counts. The percentage difference was then determined by the difference above or below the baseline count. Although the overall difference in the total number of fish counted was often small, there were often larger differences seen in the number of sockeye and chum salmon estimated. A much more rigorous calibration schedule would have been necessary before any conclusions could be made.

Chinook Salmon. The escapement estimate of chinook salmon is likely lower than the actual escapement because of chinook salmon passage before tower operations began, and identification problems. In June little spawning coloration was seen in chinook salmon. Observers relied on spotting chinook salmon by their larger size and if possible noting the black spots above the lateral line. No jack chinook salmon (four-year-old males) were spotted from the tower until late June. Without the characteristic spawning coloration, that occurred later in the run, smaller chinook salmon were believed to have been misidentified.

In the commercial catch samples in the Quinhagak District on 13 and 26 June, the jack chinook salmon catch was at 37% and 35%, respectively (Appendix E.1). The beach seine catch of 43 chinook salmon through 1 July was composed of 55% jack chinook salmon. Although both capture methods do tend to

select for smaller chinook salmon, the results do indicate the presence of jack chinook salmon, yet none were identified from the tower until late June.

During the last week of June some chinook salmon were starting to show a slight blush that aided identification. In July spawning coloration became more noticeable helping to identify chinook salmon from sockeye and chum salmon.

Sockeye Salmon. Throughout most of the season sockeye and chum salmon were the two species most likely to be misidentified because of their similar size and run timing. In June, when little spawning coloration was noticeable, distinguishing between the two species was difficult. The overall 1997 sockeye to chum escapement ratio was 1.9 to 1.0. This compared well to the ratio of 1.8 to 1.0 in the commercial catch (Appendix D.1), not withstanding the potential influence of gillnet selectivity and stock composition of the commercial catch.

In June, bright colored jack chinook salmon were likely misidentified as either sockeye or chum salmon because of their similarity in size. In late June, spawning coloration began to appear on chinook and chum salmon, but the majority of sockeye salmon continued to be bright until after mid-July (Gary Knuepfer, ADF&G, personal communication). These coloration differences in the salmon helped to distinguish them to the observers in the tower and aided speciation.

In late July and early August the species of salmon most difficult to tell apart from an observational tower were sockeye and coho salmon. Both were similar in size and when spawning coloration began to appear both species started to redden. Later the spawning coloration of the sockeye salmon was much brighter red and coho salmon were dark red.

The first coho salmon was counted from the tower on 28 July. On 29 July, 15 sockeye salmon and 9 coho salmon were captured in beach seines, yet no coho salmon were counted from the tower that day. Most likely some bright coho salmon were misidentified by the tower crew. Even in late July some sockeye salmon passing the tower continued to be bright. The chum salmon tended to be more easily identified this late in the season, as they often show darker markings on their sides and often appear striped in pink, green, or purple coloration. Therefore, the coho salmon were probably being misidentified more often as sockeye salmon than as chum salmon.

Chum Salmon. The distinctive spawning coloration of chum salmon make them one of the easiest species to identify. By late June chum salmon started to show spawning coloration at the Kanektok River tower. This was fortunate timing as a push of fish began to move past the tower the last weekend in June. Prior to 28 June less than 10% of both the chum and sockeye runs, based on salmon counts, were believed to have passed the tower site.

Chum and sockeye salmon have similar run timing patterns in the District 4 commercial fishery and this was also seen at the tower. The first quartile (25% of the run) past the counting tower for both sockeye and chum salmon was estimated to have occurred on 3 July (Table 2). Previous to spawning coloration occurring in chum salmon there was some difficulty in separating out chum, sockeye, and jack chinook salmon. The lack of spawning coloration was prevalent in the first few weeks of counting. However, as the salmon run continued into July the majority of chum salmon showed spawning coloration that improved species identification. Still, there were significant numbers of bright chum salmon seen in beach seine catches through mid-July (Gary Knuepfer, ADF&G, personal communication).

In later July identification between chum and sockeye salmon likely improved. The daily number of chum salmon passing the tower after 25 July exceeded sockeye salmon and the catch of chums in the fishery exceeded the sockeye catch during the same period.

Pink Salmon. By far the least reliable counts, in regard to speciation, were pink salmon. One pink salmon was sighted from the tower on 6 July. The next two days the pink counts were the highest of the season and over 20% of the run was estimated to have passed the tower on 7, 8, and 9 July. The increase in the number of pink salmon counted on 8 July was not reflected in the beach seine species composition for the same day (Table 3). Although pink salmon had been captured in the beach seine as early as 1 July, there was no large increase in the number of pink salmon captured until after 50% of the run was estimated to have passed the tower. For example, between 6 July and 18 July, 34 beach seine attempts captured 16 pink salmon, yet half the pink salmon run was estimated to be past the tower by 18 July. During two days, 28 and 29 July, approximately 3% of the pink salmon run was estimated to pass the tower and 11 beach seine attempts captured 107 pink salmon. It should be noted that pink salmon were not fin-clipped when captured so there could have been a number of recaptures. However, in one beach seine attempt on 29 July, 30 pink salmon were captured. Obviously, daily beach seine catches for pink salmon did not correlate well with daily tower passage.

One possible explanation for the sudden increase in pink counts, beginning on 7 July, was that Dolly Varden were being misidentified as pink salmon (Gary Knuepfer, ADF&G, personal communication). There were five Dolly Varden captured in beach seine sets on 5 and 6 July (Tables 4 and 5). On 8 July there was an increase in the number of Dolly Varden captured (34) in the beach seine sets, and only 3 pink salmon were captured. On 9 July, Dolly Varden were captured (33) in beach seine sets on both banks while no pinks were captured. The increase in Dolly Varden captured in the beach seine occurring at the same time as the counts of pink salmon skyrocketed does cast suspicion on the species identification from the tower. Also, the sonar projects, from 1984 - 1987, reported catches of Dolly Varden in test nets in July, which in three of those four years exceeded pink salmon catches (Huttunen 1984, 1985, 1986, and 1988).

Coho Salmon. In late July coho salmon began to move past the tower site. One coho salmon was captured in the beach seine on 22 July and another coho was captured the next day. However, the first coho salmon enumerated from the tower was on 28 July. No coho salmon were enumerated from the tower on 29 July, but 9 coho salmon were captured in the beach seine on that day. Likely, the crew were having difficulty identifying coho salmon because of their small numbers and similar size and coloration characteristics to sockeye salmon.

Speciation problems between sockeye and coho salmon have occurred at other counting tower projects in southwestern Alaska. In 1994, the Wood and Egegik River tower projects in Bristol Bay were extended to count coho escapement. The early portion of the coho run overlapped the end of the sockeye run, and speciation problems occurred. At Wood River, differences between beach seine composition and tower counts for sockeye and coho salmon led the crew to don dry suits, masks, snorkels and fins to observe the salmon passing the tower. A total of 66 snorkel counts by technicians were made over a 16 day period. The conclusion of these wet observations was that "bright" coho and sockeye salmon could not be accurately distinguished from the tower (Brookover and Brannian, 1995). At Egegik River, concern over the speciation of sockeye and coho salmon and budget constraints, resulted in the suspension of counts during a good portion of the species overlap period. In 1995 and 1996 the Egegik River tower project took advantage of run timing differences of sockeye and coho salmon by starting coho salmon counts approximately two weeks later than in 1994 (Keith Weiland, ADF&G, Anchorage, personal communication).

At Kanektok River tower the daily coho count surpassed the sockeye count on 4 August. This compares favorably with the commercial catch data where the coho harvest exceeded the sockeye harvest for the first time on 1 August, a lag of three days relative to the tower counts. Furthermore, on 4 August the commercial coho catch surpassed the catch of all other species combined and the coho salmon passage at the tower surpassed all other species combined on 9 August (Table 1). These examples indicate that coho salmon have about the same lag time between the fishing district and the tower as do sockeye and chum salmon. However, coho passage is often influenced by rising water levels as seen at other escapement projects and the timing at Kanektok River may be an effect of the increased in water levels during August.

The species composition of the commercial catch relative to the tower passage suggests that speciation at the tower was reasonably correct. Still, early in the coho run the crew probably misidentified some cohos, but the seine catches, alerted the crew to start observing bright salmon more closely. By 8 August over 80% of the commercial catch was coho salmon and on 11 August over 80% of the daily tower count were identified as coho, plus over 70% of that days beach seine catch was coho salmon.

Unknown Salmon. Difficulties with speciating passing salmon resulted in establishing a category for unknown salmon. This category was used when the observer could not confidently speciate the passing fish such as when poor counting conditions existed, when fish exhibited few external clues to species, or when salmon darted too quickly past the counting area. The category of unknown salmon was established on 25 June. Prior to this date the crew had been assigning all salmon observed to a known species based on the observers best assumptions. Because of the questionable nature of this practice, the crew supported establishing a category for salmon that could not be identified to species.

Prior to when the unknown category was established, less than 10% of the chum and sockeye salmon passage, and less than 20% of the season's chinook were estimated past the tower. Most of the unknown salmon counts between 25 June and late July, were likely sockeye, chum, or smaller chinook salmon, and by early August coho probably became a major component.

The number of unknown salmon counted for the season represents less than 5% of all salmon counts. However, this estimation would require the assumption that the other species were correctly identified. Likely, some species were more often misidentified and undercounted, particularly chinook salmon, and some species may have been have been overcounted.

Other Species. Other species of fish were observed from the tower, but were not enumerated. The most numerous species observed was the Rainbow smelt or Iqalluaq *Osmerus mordax*. A steady band of smelt on both banks, ranging in numbers approximately 10 to 20 wide, was moving upstream past the tower site the third week and part of the fourth week of June. Unfortunately, the dates of the run initiation and conclusion were not recorded. In 1960 smelt were reported passing the counting tower on the first day at camp, 6 June, and that the smelt were tapering off on 11 June. In that year at 1600 on 6 June there was an estimate of 2,400 smelt passing in 5 minutes (ADF&G 1960).

Dolly Varden were observed, in beach seine sets, in increasing number in July (Tables 4 and 5). Other fish observed included Arctic grayling, whitefish, and rainbow trout.

Schools of salmon smolt were seen moving downstream until early July. The white panels aided observations of smolt, especially in the twilight hours when their outmigration past the tower seemed to increase.

Beach Seining

The location, time, and species composition of every beach seine set were recorded (Tables 4 and 5). Right bank catches had more sockeye than chum salmon as did overall escapement estimates. However, catches along the left bank had almost twice as many chum salmon as sockeye. The disparity seen in the species composition of the beach seine catches between the two banks is attributed to the weir. The weir extended into the stream perpendicular to the left bank creating a pool of relatively slack water downstream of the structure. Chum salmon, more than any other species, milled in this slack water. The availability of fish close to shore made the site attractive for beach seining. Catch data reflected differences in behavior and habitat preferences between the salmon species. Huttunen (1985 and 1986) also reported that for test fishing the beach seine was more selective for chum and pink salmon than for chinook and sockeye salmon when compared with gillnets catches.

Age, Sex, and Length Composition

Chinook

Sex composition of the 92 chinook salmon sampled at Kanektok River tower was determined by examining the external characteristics of the fish. The sample was estimated to be 58% male and 42% female (Table 6). Sex of chinook caught in the commercial fishery was confirmed by visual inspection of the gonads and the composition was 65% male and 35% female.

Age composition of the tower samples was approximately 2% age 1.1, 48% age 1.2, 8% age 1.3, and 42% age 1.4 (Table 7). The commercial catch in the Quinhagak District had an season age composition estimated to be 35% age 1.2, 12% age 1.3 and 51% age 1.4, with several other age classes present in smaller proportions (Appendix E.1). Although both the beach seine and the gillnets used in the commercial fishery are selective in the size of fish caught, each gear type caught few age-1.3 fish compared to age-1.2 and age-1.4 fish. Gillnets in the commercial fishery were restricted to 6-in or smaller mesh size, and would tend to be selective for the smaller chinook salmon. Beach seines were also believed to be selective for the smaller chinook because of their distribution in the river channel closer to the shore. Still, the low percentage of age-1.3 fish may indicate a poor return of age-1.4 (six-year-old) chinook salmon in 1998.

Overall the chinook escapement samples ranged in size from 350 mm to 1,020 mm. Mean size of male chinook salmon in the escapement samples ranged from 408 mm for age-1.1 fish to 846 mm age-1.4 fish (Table 8). Female chinook salmon ranged from 569 mm for age-1.2 fish to 858 mm for age-1.4 fish. In the commercial catch mean size of male chinook ranged from 398 mm for age-1.1 fish to 985 for a single age-1.5 fish. Female chinook ranged from 636 mm for a single age-1.2 fish to 881 mm for age-1.4 fish.

Historical Kanektok River ASL composition of chinook salmon escapements from 1984 - 1987 appears in Appendix G.1.

Sockeye

Sex composition of the 865 sockeye salmon sampled at the tower was estimated to be 47% male and 53% female (Table 9). Sex of sockeye caught in the commercial fishery was confirmed by visual inspection of the gonads and the composition of 952 commercial samples was 49% male and 51% female.

Age composition of the escapement samples was approximately 47% age 1.2, and 39% age 1.3, with several other age classes present in smaller proportions (Table 10). The commercial catch in the Quinhagak District had an season age composition estimated to be 18% age 1.2, 55% age 1.3, and 10% age 1.4, with several other age classes present in smaller proportions (Appendix E.3). Both the escapement and commercial samples showed a temporal trend of age-1.2 gradually replacing age-1.3 in catch as the season progressed (Figure 12).

Overall the sockeye escapement samples ranged in size from 330 mm to 678 mm. Mean size of male sockeye salmon in the escapement samples ranged from 525 mm for age-1.2 fish to 606 mm age-1.4 fish (Table 11). Female sockeye salmon ranged from 429 mm for age-1.2 fish to 591 mm for age-0.4 fish. Overall the commercial sockeye samples ranged in size from 432 mm to 688 mm (Appendix E.4). Mean size of commercially caught male sockeye ranged from 536 mm for age-1.2 fish to 633 for age-0.4 fish. Female sockeye ranged from 489 mm for age-0.2 fish to 581 mm for both age-0.4 and -1.4 fish.

Historical Kanektok River ASL composition of sockeye salmon escapements from 1984 - 1987 appears in Appendix G.2.

Chum

Sex composition of the 1,152 chum salmon sampled at the tower was 57% male and 43% female (Table 12). Composition of the 1,221 commercial samples was 46% male and 54% female. The samples at the tower site had many more males than females when compared to the commercial samples. From June until mid-August there were more males than females in each escapement sample stratum. The temporal trend in the escapement samples, excluding the first stratum (70% male), had the number of males increasing until the second week of July and gradually decreasing thereafter. Because the sex of each fish in the escapement is determined by external characteristics, and not by visual inspection of the gonads as was done in the commercial sample, there may have been errors in sex identification. However, there may have been some gillnet selectivity in the commercial sample that would also explain the differences in the sex ratio between the tower and commercial samples.

Sex composition of the commercial fishery also showed a temporal trend. The composition of the 19 June period samples was 52% male to 48% female. Gradually the number of females in the sample began to increase with successive periods. The 11 July period samples were 43% male and 57% female. The next two weeks the commercial samples were approximately 45% male and 55% female and the final commercial sample, on 6 August, was 33% male and 67% female.

Age composition of the escapement samples was approximately 63% age 0.4, 35% age 0.3, and 1% age 0.2 and age 0.5 (Table 13). As the season progressed the proportion of age-0.3 (four-year-old) fish increased. In June, the age composition of the escapement was over 80% five-year-old fish. In July, the number of four-year-old fish in the escapement increased and surpassed the five-year-olds (Figure 13). In August, the age composition of chum salmon caught in the beach seine was approximately 75% four-year-olds. This temporal trend (NSC) in age composition of chum salmon has also been documented in the Kuskokwim River (Molyneaux and DuBois 1996) and in the Yukon River and Bristol Bay drainages (Menard 1996 and 1997).

The pattern of four-year-old chum salmon displacing five-year-old chums was also seen in the commercial fishery (Appendix E.5). The 18 July commercial sample had a majority of five-year-old fish and the next commercial sample on 25 July had a majority of four-year-old fish. Likewise, the samples at the tower showed a shift to a majority of four-year-old fish approximately the same time. The escapement sampling on 14 and 15 July had a majority of five-year-olds and the next week the sampling stratum of 21 to 23 July had a majority of four-year-olds (Table 13).

Overall the chum escapement samples ranged from 475 to 700 mm. Mean length of male chum salmon in the escapement ranged from 538 mm for age-0.2 fish to 620 mm for age-0.5 fish. Female chum salmon ranged from 542 mm for age-0.2 fish to 594 mm for a single age-0.5 fish (Table 14). Overall the chum commercial samples ranged from 464 to 698 mm. Mean length of male chum salmon in the commercial catch ranged from 513 mm for age-0.2 fish to 611 mm for age-0.5 fish. Female chum salmon ranged from 525 mm for age-0.2 fish to 582 mm for age-0.4 fish (Appendix E.6).

Within each age class, there was a tendency for length to decline (NSC) as the season progressed in the commercial fishery (Appendix E.6). The decrease in lengths was most apparent in June. The decreasing length tendency was not as discernible at the tower, but could be seen by comparing lengths from June escapements with July escapements (Table 14).

Historical Kanektok River ASL composition of chum salmon escapements from 1984 - 1987 appears in Appendix G.3.

Coho

Sex composition of the 327 coho salmon sampled at the tower was 57% male and 43% female (Table 15). Sex of coho caught in the commercial fishery was confirmed by visual inspection of the gonads and the composition of 359 commercial samples was 50% male and female. Age composition of the 115 samples taken the last few days of the escapement project was 95% age-2.1 fish (Table 16). The last two commercial samples (20 and 25 August) had an age composition of over 90% age 2.1 (Appendix E.7). Length information from the escapement project was not stratified by age (Table 17). Females sampled at the tower were slightly larger than males. Larger females were also seen in the commercial catch, but the late August samples showed both sexes to be similar in length (NSC; Appendix E.8).

Meteorology and Hydrology

Weather observations were taken most days during the counting period (Appendix C.1). Unfortunately, throughout the season there was no standardization in the time that the observations occurred, and as a result few conclusions can be made. In addition, some recordings were made sporadically. Although wind direction and speed were estimated daily, the precipitation amount was recorded less than one third of the counting days. However, this may be due to little precipitation on the days where no amount was recorded in the weather log.

Because of the weather observations occurring at various times during the day a meaningful water temperature graph was not possible. A plot of the water level data shows a steady dropping of the water level until the August rains (Figure 14). The water level gauge was in place on 11 June and observations occurred daily. The water level gauge was replaced on 15 July, after the previous one disappeared during the night. The new gauge was placed in approximately the same position and the error was probably less

than half an inch judging by the steadily dropping water levels. The peak water level was on 11 June at 2.2 feet and the lowest water level was on 8 and 9 August at approximately 0.3 feet. The water level when the counting was terminated on 21 August was 1.5 feet. Water clarity was clear throughout the project, except for a few days during or following a heavy rain.

Water discharge for Kanektok River was measured on 27 July and was 799.9 cubic feet per second (Appendix C.2). During the tower project the water level ranged from 0.31 to 2.2 feet and the level on 27 July was 0.51 feet. The discharge estimate therefore represents the lower end of the spectrum. Also, according to Quinhagak residents, the water level on the Kanektok River for the last two years has been lower than normal.

CONCLUSIONS

The counting program at Kanektok River tower in 1997 was a great improvement from the previous year. The 24-hour counts and the use of digital timers ensured a systematic sampling of the run. A consistent counting tower project will be needed for several years before making conclusions as to the escapement characteristics and run timing of Kanektok River salmon; still the 1997 operation laid an important foundation for better understanding and management of the Kanektok River salmon runs.

Species identification was the biggest concern in estimating escapement. The use of two towers proved more effective than one tower in speciating salmon. There were questions as to the accurate identification of smaller chinook and pink salmon. Because there were few chinook salmon of similar size to sockeye and chum salmon counted in June there was probably a number of smaller chinook salmon being misidentified.

Run timing for sockeye, chum and coho salmon was approximately five days from the commercial fishing district to the tower site. However, a more exhaustive study on run timing and species identification would be needed over several years to see if run timing continues to exhibit this pattern.

To obtain more accurate species identification it may be more scientifically valid and economically viable to install a weir. The assumed misidentification of smaller chinook and pink salmon would be eliminated with the weir. A weir would not require a 24-hour counting schedule. Also, the use of a weir would enable fish to be sampled without using a beach seine thereby reducing operational costs. Both Sport Fish Division of ADF&G and USFWS have indicated they would be more willing to fund a weir project.

The long-term viability of the project is in question due to the more typical water conditions that could be expected in most years. History has shown in previous years that projects have had problems with high water and rain. The low water conditions of 1997 may not be repeated very often in future years.

RECOMMENDATIONS FOR FUTURE OPERATION

The 1997 tower project provided useful information about salmon escapements in the Kanektok River. Being the first full season of operation there were many unforeseen challenges. These challenges are described below along with some possible solutions. Also listed are other suggestions which may help to improve our ability to accurately monitor salmon escapement to the Kanektok River in the future.

Camp

The location of the camp and towers had many drawbacks. The counting tower, which is located on Native allotment, requires a rental fee. The proximity of camp to the village resulted in the crew commuting to work and sometimes being late for shifts or otherwise unavailable when needed. To alleviate these problems it is recommended that the camp be moved approximately seven miles upstream to a new site that was selected last fall by the NVK staff. This new site will be located on Native Corporation land so the land fee would be waived. In addition this new site is thought to have better water clarity and may improve speciation of salmon. The water clarity at the present camp deteriorates markedly during higher water due to a cutbank about one mile upriver that releases mud into the river.

Construction of a temporary campsite to be used for living facilities for a full time crew of five people and possibly three temporary residents will be needed. One wall tent or weatherport tent will be needed to serve as a cook tent and office. Two additional tents would serve for sleeping and living facilities and built in bunks or cots with pads will be needed for the crew. The sleeping facilities should be well back from the cook tent and river so those who are sleeping can do so without disruptions. Also, some type of steam bath or shower system for crew hygiene will be necessary.

The past season with the crew commuting to the camp there were times when no boats were available at camp. This year two boats should be required on site with a minimum outboard jet of 40 hp. One boat should always be left on site to allow for seining activities and for transportation in cases of emergency.

There was a lack of tools in camp to do standard field camp projects in 1997. Instead of having to borrow tools as needed, a standard toolbox with tools, shovels, saws, hammers, sledge, etc. should be purchased and these tools should be left in camp throughout the season.

Personnel

For the 1998 season the crew should be required to live at the camp, except for their days off. In 1997 there was confusion as to getting someone to work the shift when no one showed up for work. Having the crew in camp will help with communication and will be an asset if any emergency arises. There will likely be savings in fuel expenses.

Because up to six or seven people may be at the camp (4 NVK crew, 1 NVK project leader, 1 ADF&G employee, and possibly 1 or 2 visitors from ADF&G, USFWS, or BSFA), we should avoid having Summer Youth Employees (SYE) or other visitors from town sleeping over at the camp. With the large crew they will need some private time to get rest and more than the needed amount of people leads to disruptions.

ADF&G will provide the catch monitor to assist the tower crew with counting and seining activities. The ADF&G technician will serve as a crew member, but will be supervised by Fish & Game. The technician will concentrate the majority of effort on the tower project, taking part in counting and seining activities, but may be required periodically (two or three times per month) to sample the commercial catch.

A new project leader will be working with the crew in 1998. The NVK Project Leader (PL) should spend several days each week at the camp from mid-June to mid-July and from mid-August until early September to become familiarized with peak salmon passage of each salmon species. The PL should become familiar with all aspects of the project. The PL should do counts from the tower at different times during the 24-hour counting period to become familiar with salmon behavior past the site, to assess any speciation problems, and to assist in ASL sampling. The PL should enter the count data into an EXCEL spreadsheet once each week in order to identify and correct errors.

The accuracy of counting and species identification by SYE was called into question in 1997. Because the SYE are not familiarized with counting procedures only the trained crew should do counts in 1998. There should be no problems having all the work done by the tower crew. If SYE take part in seining activities have them arrive after noon. Less than 25% of the beach seine sets were done in the morning hours in 1997 and having SYE there in the morning when activities are minimal would be a waste of time. Also, by having them come in the afternoon helps to reduce the disruption in camp for the swing and graveyard shift persons who are trying to sleep in the morning.

The ADF&G catch monitor may need to sample the commercial catch when biologists in Bethel are unable to sample catch. As training for the SYE have them get experience sampling fish by sampling the commercial catch with the ADF&G catch monitor. The extra help would make the sampling go quicker and it is easier to learn how to take scales and other needed sampling skills while working on dead fish. The catch monitor will sample three salmon species approximately three times per month and depending on catch rates would take about five hours of time from the SYE.

Counting and Sampling

The movement of flash panels by river current spooked the migrating salmon and made counting difficult in 1997. Weighted bars to hold the flash panels down were secured with seining twine and ripped off, the downstream edge of the panels, after a few days. The most critical improvement for the 1998 counting tower is to stop the movement of the panels. It will be necessary to use either fencing or weights to hold the panels down. If iron bars are used, the bars should be attached to both the upstream and downstream edge of panels and secured with rope. If possible the panels should be replaced with an off-white color to reduce fish avoidance reactions. Gromlets on the panels should be spaced a foot apart to allow for weights to be secured to hold the panels down in the current.

In 1998 the crew should be trained in counting procedures by the NVK crewleader. Only those who are part of the trained crew and have the specific job duty to count salmon from the tower would be able to count from the tower, i.e., the SYE should not do official counts. The NVK crewleader should do calibration counts periodically with the crew to check for accuracy in counting and speciating. All calibration counts should be recorded.

The ADF&G catch monitor will be available to assist the NVK crewleader in the training of the crew in counting and sampling fish caught in the beach seine. The ADF&G catch monitor will demonstrate the proper procedures in sampling fish and mounting the scales on the gum cards.

In 1997 counting from only one tower led to a larger number of unknown salmon species count. Therefore in 1998 to help with salmon species identification, two towers should be used. Construction of a partial weir will help in speciation by reducing the river channel available for the fish to pass and allowing for closer observation from the tower. Ten minute counts are to occur on each river bank. After crossing the river the observer should wait a few minutes, before beginning the count, to allow the salmon to resume normal passing rates.

Some equipment was not operational when counting was to begin in 1997. Before counting begins this season, counters and digital timers should be checked. Timers should be calibrated to make sure that they are accurate. Counters should be oiled and tested to make sure no sticking or skipping is occurring as counting proceeds. Two polarized glasses should be available in both towers. Storage boxes with the needed timers, counters, and glasses should be tied to each tower on the platform.

There was a lack of observations in regards to fish passage being recorded in the camp log or in the comments section of the enumeration sheets. Specific observations in regard to trends observed of fish passage should be recorded in the camp log. Events, such as, when the first jack salmon are identified due to their spawning coloration should be recorded. Notes on other species of fish, like when the migration of smelt is occurring, etc. should be recorded. The start, peak, and end of the smelt migration should be noted in the camp log. There is no need to count the smelt, but an estimate of the width (in numbers of fish) of the bands of smelt passing the tower each day should be attempted. The time of day that schools of smolt are observed passing by the tower should be recorded. This periphery data may be used by the Natural Resources staff in the future to determine broad trends of the status of species in the Kanektok River drainage.

The 60 minute counts should be continued periodically throughout the season, with the recording of each of the 10 minute counts during the hour-long count. The number of full hour counts should be done at both high and low passage rates.

The seines and live box will need to be mended before sampling begins in 1998. Log notes on seining activities should continue to be kept in regard to location, time, and catch. Effort should continue on both riverbanks regardless of whether fish are easier to catch on one bank versus the other.

Pink salmon are expected to have a significantly larger return in 1998 and sex composition could be useful baseline data. In addition pink salmon and Dolly Varden should be fin-clipped to see how many recaptures are occurring. This will help to determine whether these species are holding in the sampling area.

To reduce overtime, time management improvements can be made in 1998. When the counting is complete for each hour the crew member should look for various projects to complete. If seining activities are occurring the crew member is to take part when not counting. The graveyard shift worker is to double check all numbers added for the previous day. Day and swing shift crew members are responsible for charging all batteries, filling all fuel tanks, mending seines, etc. When in pay status the crew should work on projects that need to be completed around camp, as most of these duties can be done between counting duties. Between counts, numbers can be double-checked for accuracy.

Meteorological and hydrological data were taken at random times during the day in 1997. This season weather readings should be taken at a set time each day to establish baseline data that can be used in the future. As part of the counting duties weather should be recorded while on shift. Water temperature should be recorded every four hours at 0000, 0400, 0800, 1200, 1600, and 2000. Air temperature, wind velocity, sky conditions should be recorded at 0800 and 2000 each day. Water clarity and level should be recorded once each day at 1200. Precipitation levels should be recorded and the rain gauge emptied each day at midnight. Any unusual weather or water conditions should be noted in the comment section of the weather log. In the future the purchase of a small weather station would be beneficial to collecting baseline data at the campsite.

Termination of Project

The 1997 project was terminated with no input from the agencies providing support for the project. The counts were terminated on 21 August due to an increase in water level and turbidity after a few days of rain. The water level at the gauge site when tower counts were suspended was 1.44 feet. This was approximately 2 inches higher than when the weir was extended on 27 June and over 9 inches lower than when counting began on 11 June (Appendix C.1). In 1998 if counts are suspended due to river conditions all agencies involved will be notified. If there is the possibility of termination of the project before the agreed upon date of mid-September all agencies will be notified before any camp breakdown is initiated and a discussion between the agencies should occur before the project is terminated.

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Table 1. Kanektok River estimated daily escapement, 1997.

Date	Hours Counted	Hours Estimated	King	Red	Chum	Pink	Coho	Unknown
11-Jun	24	24	144	0	12			
12-Jun	12	12	12	0	6			
13-Jun	0	0						
14-Jun	18	18	36	0	54			
15-Jun	22	24	54	72	78			
16-Jun	24	24	78	78	84			
17-Jun	24	24	168	30	54			
18-Jun	19	24	168	72	336			
19-Jun	21	24	192	366	330			
20-Jun	24	24	54	102	54			
21-Jun	23	24	174	480	162			
22-Jun	24	24	306	432	456			
23-Jun	24	24	222	480	396			
24-Jun	24	24	660	1,092	684			
25-Jun	24	24	798	912	780			60
26-Jun	24	24	312	876	546			78
27-Jun	21	24	654	678	576			48
28-Jun	24	24	705	1,854	876			75
29-Jun	24	24	465	2,112	732			99
30-Jun	24	24	516	4,506	1,923			636
01-Jul	24	24	414	3,087	1,782			405
02-Jul	24	24	315	4,131	1,971			645
03-Jul	24	24	654	3,198	2,094			642
04-Jul	24	24	612	3,750	2,004			192
05-Jul	24	24	1,380	6,792	2,334			240
06-Jul	22	24	1,128	7,608	2,100	6		42
07-Jul	24	24	324	5,742	1,182	744		96
08-Jul	24	24	276	2,574	978	756		126
09-Jul	24	24	150	4,140	1,086	408		66
10-Jul	24	24	180	3,030	666	138		66
11-Jul	19	24	378	3,780	1,476	426		24
12-Jul	24	24	786	3,966	2,736	150		48
13-Jul	24	24	300	1,512	318	324		12
14-Jul	24	24	282	2,448	1,140	672		48
15-Jul	24	24	204	2,076	1,266	162		36
16-Jul	21	24	294	2,592	852	252		0
17-Jul	21	24	186	2,838	1,134	312		0
18-Jul	24	24	198	2,772	1,062	84		6
19-Jul	16	16	462	3,192	3,360	102		84
20-Jul	11	11	774	2,208	1,482	108		228

-Continued-

Table 1. (page 2 of 2).

Date	Hours Counted	Hours Estimated	King	Red	Chum	Pink	Coho	Unknown
21-Jul	15	15	138	2,460	654	160		0
22-Jul	16	16	162	924	360	210		12
23-Jul	16	16	114	1,008	564	144		0
24-Jul	16	16	60	378	132	132		6
25-Jul	16	16	90	216	132	42		12
26-Jul	17	17	24	348	438	24		18
27-Jul	14	17	30	660	936	90		48
28-Jul	24	24	156	1,236	1,674	144	6	0
29-Jul	24	24	108	534	1,032	102	0	0
30-Jul	24	24	108	294	372	102	36	12
31-Jul	24	24	138	624	780	156	60	0
01-Aug	24	24	78	396	840	72	60	0
02-Aug	24	24	138	378	456	96	276	6
03-Aug	24	24	30	264	462	60	234	102
04-Aug	24	24	72	228	786	240	552	60
05-Aug	24	24	-12	216	486	186	450	228
06-Aug	24	24	12	168	264	132	426	36
07-Aug	24	24	42	90	240	120	306	6
08-Aug	24	24	48	90	252	114	336	6
09-Aug	24	24	48	72	180	60	1,260	6
10-Aug	24	24	36	66	270	66	1,956	36
11-Aug	24	24	0	84	180	78	2,058	246
12-Aug	24	24	36	48	120	60	2,190	210
13-Aug	24	24	12	36	84	36	1,326	72
14-Aug	24	24	-12	0	42	90	1,266	24
15-Aug	24	24	36	36	78	42	1,704	12
16-Aug	24	24	0	12	30	108	1,200	24
17-Aug	24	24	30	6	42	138	1,248	30
18-Aug	24	24	6	54	90	90	1,740	6
19-Aug	24	24	0	6	42	78	906	12
20-Aug	24	24	0	18	24	72	3,318	0
21-Aug	10	11	0	0	0	6	258	0
Total			16,743	96,528	51,204	7,894	23,172	5,232

Table 2. Cumulative percentage of run past Kanektok River tower for king, red, and chum salmon, 1997.

Date	Hours Counted	Hours Estimated	King		Red		Chum	
			Num	Cum %	Num	Cum %	Num	Cum %
11-Jun	24	24	144	0.86	0		12	0.02
12-Jun	12	12	12	0.93	0		6	0.04
13-Jun	0	0		0.93				0.04
14-Jun	18	18	36	1.15	0		54	0.14
15-Jun	22	24	54	1.47	72	0.08	78	0.29
16-Jun	24	24	78	1.94	78	0.16	84	0.46
17-Jun	24	24	168	2.94	30	0.19	54	0.56
18-Jun	19	24	168	3.94	72	0.26	336	1.22
19-Jun	21	24	192	5.09	366	0.64	330	1.86
20-Jun	24	24	54	5.41	102	0.75	54	1.97
21-Jun	23	24	174	6.45	480	1.24	162	2.29
22-Jun	24	24	306	8.28	432	1.69	456	3.18
23-Jun	24	24	222	9.60	480	2.19	396	3.95
24-Jun	24	24	660	13.55	1,092	3.32	684	5.29
25-Jun	24	24	798	18.31	912	4.26	780	6.81
26-Jun	24	24	312	20.18	876	5.17	546	7.87
27-Jun	21	24	654	24.08	678	5.87	576	9.00
28-Jun	24	24	705	28.29	1,854	7.80	876	10.71
29-Jun	24	24	465	31.07	2,112	9.98	732	12.14
30-Jun	24	24	516	34.15	4,506	14.65	1,923	15.90
01-Jul	24	24	414	36.62	3,087	17.85	1,782	19.38
02-Jul	24	24	315	38.51	4,131	22.13	1,971	23.23
03-Jul	24	24	654	42.41	3,198	25.44	2,094	27.31
04-Jul	24	24	612	46.07	3,750	29.33	2,004	31.23
05-Jul	24	24	1,380	54.31	5,792	36.36	2,334	35.79
06-Jul	22	24	1,128	61.05	7,608	44.24	2,100	39.89
07-Jul	24	24	324	62.98	5,742	50.19	1,182	42.20
08-Jul	24	24	276	64.63	2,574	52.86	978	44.11
09-Jul	24	24	150	65.53	4,140	57.15	1,086	46.23
10-Jul	24	24	180	66.60	3,030	60.29	666	47.53
11-Jul	19	24	378	68.86	3,780	64.20	1,476	50.41
12-Jul	24	24	786	73.55	3,966	68.31	2,736	55.75
13-Jul	24	24	300	75.35	1,512	69.88	318	56.38
14-Jul	24	24	282	77.03	2,448	72.41	1,140	58.60
15-Jul	24	24	204	78.25	2,076	74.57	1,266	61.07
16-Jul	21	24	294	80.00	2,592	77.25	852	62.74
17-Jul	21	24	186	81.11	2,838	80.19	1,134	64.95
18-Jul	24	24	198	82.30	2,772	83.06	1,062	67.03
19-Jul	16	16	462	85.06	3,192	86.37	3,360	73.59
20-Jul	11	11	774	89.68	2,208	88.66	1,482	76.48

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Table 2. (page 2 of 2).

Date	Hours Counted	Hours Estimated	King		Red		Chum	
			Num	Cum %	Num	Cum %	Num	Cum %
21-Jul	15	15	138	90.50	2,460	91.21	654	77.76
22-Jul	16	16	162	91.47	924	92.16	360	78.46
23-Jul	16	16	114	92.15	1,008	93.21	564	79.56
24-Jul	16	16	60	92.51	378	93.60	132	79.82
25-Jul	16	16	90	93.05	216	93.82	132	80.08
26-Jul	17	17	24	93.19	348	94.18	438	80.94
27-Jul	14	17	30	93.37	660	94.87	936	82.76
28-Jul	24	24	156	94.30	1,236	96.15	1,674	86.03
29-Jul	24	24	108	94.95	534	96.70	1,032	88.05
30-Jul	24	24	108	95.59	294	97.00	372	88.77
31-Jul	24	24	138	96.42	624	97.65	780	90.30
01-Aug	24	24	78	96.88	396	98.06	840	91.94
02-Aug	24	24	138	97.71	378	98.45	456	92.83
03-Aug	24	24	30	97.89	264	98.73	462	93.73
04-Aug	24	24	72	98.32	228	98.96	786	95.27
05-Aug	24	24	-12	98.24	216	99.19	486	96.22
06-Aug	24	24	12	98.32	168	99.36	264	96.73
07-Aug	24	24	42	98.57	90	99.45	240	97.20
08-Aug	24	24	48	98.85	90	99.55	252	97.69
09-Aug	24	24	48	99.14	72	99.62	180	98.04
10-Aug	24	24	36	99.36	66	99.69	270	98.57
11-Aug	24	24	0	99.36	84	99.78	180	98.92
12-Aug	24	24	36	99.57	48	99.83	120	99.16
13-Aug	24	24	12	99.64	36	99.86	84	99.32
14-Aug	24	24	-12	99.57	0	99.86	42	99.40
15-Aug	24	24	36	99.79	36	99.90	78	99.56
16-Aug	24	24	0	99.79	12	99.91	30	99.61
17-Aug	24	24	30	99.96	6	99.92	42	99.70
18-Aug	24	24	6	100	54	99.98	90	99.87
19-Aug	24	24	0	100	6	99.98	42	99.95
20-Aug	24	24	0	100	18	100	24	100
21-Aug	10	11	0	100	0	100	0	100

Table 3. Beach seine catch composition of Kanektok River salmon, 1997.

Date	Bank	Sets	King	Red	Chum	Pink	Coho
19-Jun	Left	4	1	2	4		
22-Jun	Left	5		5	24		
24-Jun	Left	3	2	4	11		
25-Jun	Left	4	3	21	49		
26-Jun	Left	7	23	21	10		
28-Jun	Left	3	7	25	26		
30-Jun	Left	3	3	53	108		
	Right	3	1	45	16		
01-Jul	Left	4	4	65	94	1	
	Right	1					
05-Jul	Left	3	9	28	42		
	Right	3	1	16	20	1	
06-Jul	Left	4	6	33	46	1	
	Right	4	3	41	8	2	
08-Jul	Left	2	1	52	77	2	
	Right	3	6	12	25	1	
09-Jul	Left	3	1	35	50		
	Right	1			1		
14-Jul	Left	2	3	42	123	5	
	Right	1		1	1		
15-Jul	Left	3	1	53	96	1	
	Right	1		17	12		
17-Jul	Left	4	1	36	49	2	
	Right	4	2	36	21	1	
18-Jul	Right	2		56	19	1	
21-Jul	Left	2	2	18	82	33	
	Right	2	1	7	9	1	
22-Jul	Left	4	3	9	46	35	1
	Right	2		1	15		
23-Jul	Left	4		29	83	35	1
	Right	4	2	13	27	9	
24-Jul	Right	1		1	2		
28-Jul	Left	5	5	43	55	58	5
	Right	1			6	1	
29-Jul	Left	4	1	10	44	46	6
	Right	1		5	4	2	3
30-Jul	Left	4	3	17	29	16	2
	Right	2		1	1	4	
31-Jul	Left	6	1	14	24	3	4
	Right	4		5	4	2	2
1-Aug	Left	5		19	19	9	7
	Right	2		2	12		1
5-Aug	Left	3		3	17	37	10
	Right	1			6	4	

-Continued-

Table 3. (page 2 of 2).

Date	Bank	Sets	King	Red	Chum	Pink	Coho
8-Aug	Left	1				3	2
	Right	1		1	5	1	2
11-Aug	Left	5		1	20	6	68
	Right	1					7
12-Aug	Left	1			7	2	66
	Right	2		2	2	1	15
18-Aug	Left	2		1	4	7	54
19-Aug	Left	2		1	2	5	45
20-Aug	Left	4				14	62
Total Left Bank		106	80	640	1,241	321	333
Total Right Bank		47	16	262	216	31	30
Total Both Banks		153	96	902	1,457	352	363

Table 4. Beach seine species composition by set for left bank of Kanektok River, 1997.

Date	Set No.	Time of set	Location downstream from tower	King	Red	Chum	Pink	Coho	Dolly	Whitefish	Rainbow	Recaptured Salmon
19-Jun	1	1500	20 meters									
	2	1515	"									
	3	1530	"	1	2	4						
	4	1830	"									
22-Jun	5	1525	"			9						
	6	1545	"			8						
	7	1610	"		1	5						
	8	1750	"		4	2						
	9	1815	"									
24-Jun	10	2050	"		2	5						
	11	2145	"		1	4						1 chum
	12	2215	"	2	1	2						
25-Jun	13	1400	"	2	11	43						
	14	1900	"			1						1red 1chum
	15	1920	"		6	2						1 chum
	16	1950	"	1	4	3						1 chum
26-Jun	17	1345	"		7	1						
	18	1430	"		1							
	19	1530	"									2 red
	20	1630	"	15	9	7						2 red
	21	1740	"	1	1							
	22	1930	"	4		2			1	4		
	23	1945	"	3	3					2		1 chum
28-Jun	24	1530	"	2	12	18						
	25	1700	"	1	4	5						1red 1chum
	26	1730	"	4	9	3						4red 3chum
30-Jun	27	0930	"	1	17	57						2red 1chum
	28	1030	"	1	5	25						1red 4chum
	29	1120	"	1	31	26						2red 7chum
01-Jul	34	1245	"	1	22	46						6 red
	35	1330	"	The number of fish captured in sets 35 and 36 were combined								
	36	1345	"	with set 37.								
	37	1355	"	3	43	48	1					22red 4chum
05-Jul	38	1345	"	3	13	25			1			
	39	1545	"	4	9	12	1					1red 3chum
	40	1645	"	2	6	5						1 chum
06-Jul	48	1650	"		7	30						
	49	1750	"	4	11	15						3red 2chum
	50	1850	"	The number of fish captured in set 50 were combined with set 51.								
	51	1855	"	2	15	1	1					4red 1chum
08-Jul	52	0930	"	1	21	54						
	53	1050	"		31	23	2			1		2 chum

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Table 4. (page 2 of 3).

Date	Set No.	Time of set	Location downstream from tower	King	Red	Chum	Pink	Coho	Dolly	White-fish	Rainbow	Recaptured Salmon
09-Jul	58	1155	20 meters		23	36			14			1red 3chum
	59	1245	"	The number of fish captured in set 59 were combined with set 60.								
	60	1255	"	1	12	14			7		1	1 chum
14-Jul	61	1145	"	1	16	87	5		5			
	63	1415	"	2	26	36						1red 9chum
15-Jul	64	1445	"		21	79	1		10			2 red
	65	1745	"	1	31	10			2			2red 13chum
	66	1845	"		1	7						1red 2chum
17-Jul	69	1345	"	1	8	27	1		25			
	70	1400	"		10	16	1		24			
	71	1430	"		4	1			10			
	72	1455	"		14	5			26		1	3 red
21-Jul	80	1830	10 meters	2	14	68	17		24			1red 2chum
	81	2130	"		4	14	16		10			1red 7chum
22-Jul	82	1030	"		3	28	21		71			1red 1chum
	83	1130	"		2	10	9		60			
	84	1830	"	2	3	5	2	1	46			1red 1chum
	85	1925	"	1	1	3	3		6			
23-Jul	89	1045	"		1	19	8		29			1 chum
	90	1130	"		13	32	21		135			1 chum
	91	1830	"		15	23	4		60		1	2 chum
	92	1930	"			9	2	1	15	1		
28-Jul	98	1345	"		9	9	12		8			
	99	1430	"		17	9	20	2	24			
	100	1630	"	1	9	13	15		28		1	2red 1chum
	101	1730	"		6	11	6	2	27			
	102	1830	"	4	2	13	5	1	20			
29-Jul	103	1300	"		4	32	30	3	66			3 red
	104	1400	"			3	8	1	20	1		1 coho
	105	2115	"	1	5	8	8	1	24			1red 2chum
	106	2150	"		1	1		1	1			
30-Jul	109	1145	"	2	7	22	8		44			
	110	1240	"	1	4	1	2		16			
	111	1920	"		5	5	6	1	20			1red 1chum
	112	1935	"		1	1		1	8	1		
31-Jul	116	1045	"		2	1	2		13			
	117	1120	"			1						1 red
	118	1300	"	1	2	1			4			1 red
	121	1955	"		2	2			2			
	122	2020	"		8	17	1	3	2			1 chum
	123	2140	"			2		1	2			

-Continued-

Table 4. (page 3 of 3).

Date	Set No.	Time of set	Location downstream from tower	King	Red	Chum	Pink	Coho	Dolly	White-fish	Rainbow	Recaptured Salmon
01-Aug	124	0945	10 meters		5	17	8	5	17			
	125	1030	"		2	1			5	1		1 red
	126	1045	"		8			2	3			
	129	2050	"		3	1	1		6			
	130	2100	"		1				4			2 red
05-Aug	131	1000	"		2	14	30	5	18			
	132	1030	"			3	6	2	13			
	133	1040	"		1		1	3	5			
08-Aug	136	1120	"				3	2	57			
11-Aug	137	1000	"			13	1	46	8			
	138	1100	"			4		5	18			
	140	1255	"			2	1	4	6			
	141	1400	"			1	1	10	4			1 coho
	142	1420	"		1		3	3	5	2		1 coho
12-Aug	145	1130	"			7	2	66	10			2 coho
18-Aug	146	1750	"		1	4	6	46	6			
	147	1830	"				1	8	3			2 coho
19-Aug	148	1115	"		1	1	4	41	3			
	149	1915	"			1	1	4	4			
20-Aug	150	1130	"				7	40	11			1 coho
	151	1220	"				7	14	6	2		
	152	1825	"					4	3	2		
	153	1835	"					4				

Table 5. Beach seine species composition by set for right bank of Kanektok River, 1997.

Date	Set No.	Time of set	Location downstream from tower	King	Red	Chum	Pink	Coho	Dolly	White-fish	Rainbow	Recaptured Salmon
30-Jun	30	1340	150 meters		8							
	31	1355	"	1	13	4						
	32	1430	"		24	12						1 red
01-Jul	33	1230	"									
05-Jul	41	1715	"		8	7						1 chum
	42	1950	"	The number of fish captured in set 42 were combined with sel 43.								
	43	2000	"	1	8	13	1		2	2		1 chum
06-Jul	44	1445	"	2								
	45	1455	250 meters		18	5	1					1 chum
	46	1600	"	The number of fish captured in set 46 were combined with set 47.								
	47	1605	"	1	23	3	1		2	2		1 red
08-Jul	54	1350	"	3	7	13	1		6			3red 3chum
	55	1430	"	3	4	10			8			1red 6chum
	56	1455	100 meters		1	2			8			
09-Jul	57	1145	"			1			12			
14-Jul	62	1400	"		1	1						
15-Jul	67	1915	"		17	12			14			1red 7chum
17-Jul	68	1330	"		2	6			4		1	
	73	1800	"		9	2	1		5			
	74	1845	"	1	17	7			8			
	75	1945	"	1	8	6			7	1		
18-Jul	76	1745	"		27	14			4			
	77	1845	"		29	5	1		14	1		
21-Jul	78	1330	"	The number of fish captured in set 78 were combined with set 79.								
	79	1345	"	1	7	9	1		20	1		
22-Jul	86	1945	"		1	8			8			3chum 1coho
	87	2025	"			7			7			
23-Jul	88	0945	"		1	6	1		26	1		
	93	2030	"			11						1r 3ch 1 co
	94	2045	"		4	7	6		23			
	95	2245	"		8	3	2		5	1		
24-Jul	96	0945	"		1	2			32			
28-Jul	97	1315	"			6	1			1		
29-Jul	107	2230	"		5	4	2	3	5			3 chum
30-Jul	108	1130	"			1			2	1		
	113	2015	"		1		4		3			1 chum
31-Jul	114	1000	"		2	3	1		8			
	115	1020	"		3	1			4			
	119	1315	"				1	2	2			1 chum
	120	1940	"						2			
01-Aug	127	1120	"		1	10		1				7 chum
	128	2040	"		1	2			3	1		

-Continued-

Table 5. (page 2 of 2).

Date	Set No.	Time of set	Location downstream from tower	King	Red	Chum	Pink	Coho	Dolly	White-fish	Rainbow	Recaptured Salmon
05-Aug	134	1100	100 meters			6	4		8			2chum 2coho
08-Aug	135	1030	"		1	5	1	2	68			
11-Aug	139	1230	"					7				3chum 11coho
12-Aug	143	1050	"		2	2	1	9	6	2		
	144	1110	"					6	25	1		

Table 6. Sex composition of Kanektok River chinook salmon escapement samples, 1997.

Date	Sample Size		Daily Sex Composition		Daily Percentage Sex Composition		Cumulative Sex Composition		Cum Percentage Sex Composition	
	Daily	Cum	Male	Female	Male	Female	Male	Female	Male	Female
19-Jun	1	1	1	0	100	0	1	0	100	0
24-Jun	2	3	2	0	100	0	3	0	100	0
25-Jun	3	6	0	3	0	100	3	3	50	50
26-Jun	23	29	15	8	65	35	18	11	62	38
28-Jun	7	36	5	2	71	29	23	13	64	36
30-Jun	4	40	1	3	25	75	24	16	60	40
01-Jul	3	43	2	1	67	33	26	17	60	40
05-Jul	9	52	9	0	100	0	35	17	67	33
06-Jul	9	61	3	6	33	67	38	23	62	38
08-Jul	7	68	5	2	71	29	43	25	63	37
09-Jul	1	69	0	1	0	100	43	26	62	38
14-Jul	3	72	1	2	33	67	44	28	61	39
15-Jul	1	73	0	1	0	100	44	29	60	40
17-Jul	3	76	2	1	67	33	46	30	61	39
21-Jul	2	78	1	1	50	50	47	31	60	40
22-Jul	3	81	2	1	67	33	49	32	60	40
23-Jul	2	83	0	2	0	100	49	34	59	41
28-Jul	5	88	2	3	40	60	51	37	58	42
30-Jul	3	91	1	2	33	67	52	39	57	43
31-Jul	1	92	1	0	100	0	53	39	58	42

Table 7. Age and sex composition of Kanektok River chinook salmon escapement samples, 1997.

		Brood Year and Age Group			
		1994	1993	1992	1991
		1.1	1.2	1.3	1.4
Stratum Dates:	6/11-7/03				
Sampling Dates:	6/19, 6/24-26, 6/28, 6/30, 7/01				
Sample Size:	40				
Male	Sample Size	1	19	1	3
	Percent of Sample	2.5	47.5	2.5	7.5
Female	Sample Size		3	2	11
	Percent of Sample		7.5	5.0	27.5
Total	Sample Size	1	22	3	14
	Percent of Sample	2.5	55.0	7.5	35.0
Stratum Dates:	7/04-7/11				
Sampling Dates:	7/05-7/06, 7/08-09				
Sample Size:	25				
Male	Sample Size	1	10	2	4
	Percent of Sample	4.0	40.0	8.0	16.0
Female	Sample Size		4		4
	Percent of Sample		16.0		16.0
Total	Sample Size	1	14	2	8
	Percent of Sample	4.0	56.0	8.0	32.0
Stratum Dates:	7/12-8/18				
Sampling Dates:	7/14-15, 7/17, 7/21-23, 7/28, 7/30-31				
Sample Size:	20				
Male	Sample Size		4	2	2
	Percent of Sample		20.0	10.0	10.0
Female	Sample Size		2		10
	Percent of Sample		10.0		50.0
Total	Sample Size		6	2	12
	Percent of Sample		30.0	10.0	60.0
Stratum Dates:	Season				
Sample Size:	85				
Male	Sample Size	2	33	5	9
	Percent of Sample	2.1	37.0	6.3	10.5
Female	Sample Size		9	2	25
	Percent of Sample		10.5	2.1	31.5
Total	Sample Size	2	42	7	34
	Percent of Sample	2.1	47.5	8.4	42.0

Table 8. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Kanektok River chinook salmon escapement samples, 1997.

		Brood Year and Age Group			
		1994	1993	1992	1991
		1.1	1.2	1.3	1.4
Stratum Dates:	6/11-7/03				
Sample Size:	40				
Male	Mean Length	465	542	595	786
	Std. Error	-	11	-	81
	Range	465-465	495-675	595-595	625-885
	Sample Size	1	19	1	3
Female	Mean Length		621	770	815
	Std. Error		16	110	21
	Range		590-640	660-880	675-896
	Sample Size		3	2	11
Stratum Dates:	7/04-7/11				
Sample Size:	25				
Male	Mean Length	350	517	733	850
	Std. Error	-	14	8	13
	Range	350-350	463-595	725-740	815-870
	Sample Size	1	10	2	4
Female	Mean Length		528		869
	Std. Error		19		21
	Range		480-565		817-904
	Sample Size		4		4
Stratum Dates:	7/12-8/18				
Sample Size:	20				
Male	Mean Length		548	753	903
	Std. Error		38	38	23
	Range		445-628	715-790	880-925
	Sample Size		4	2	2
Female	Mean Length		570		887
	Std. Error		30		19
	Range		540-600		805-1020
	Sample Size		2		10
Stratum Dates:	Season				
Sample Size:	85				
Male	Mean Length	408	536	719	846
	Range	350-465	445-675	595-790	625-925
	Sample Size	2	33	5	9
Female	Mean Length		569	770	858
	Range		480-640	660-880	675-1020
	Sample Size		9	2	25

Table 9. Sex composition of Kanektok River sockeye salmon escapement samples, 1997.

Date	Sample Size		Daily Sex Composition		Daily Percentage Sex Composition		Cumulative Sex Composition		Cum Percentage Sex Composition	
	Daily	Cum	Male	Female	Male	Female	Male	Female	Male	Female
19-Jun	2	2	1	1	50	50	1	1	50	50
22-Jun	5	7	1	4	20	80	2	5	29	71
24-Jun	4	11	2	2	50	50	4	7	36	64
25-Jun	21	32	12	9	57	43	16	16	50	50
26-Jun	21	53	13	8	62	38	29	24	55	45
28-Jun	25	78	14	11	56	44	43	35	55	45
30-Jun	93	171	42	51	45	55	85	86	50	50
01-Jul	64	235	30	34	47	53	115	120	49	51
05-Jul	43	278	23	20	53	47	138	140	50	50
06-Jul	70	348	38	32	54	46	176	172	51	49
08-Jul	64	412	35	29	55	45	211	201	51	49
09-Jul	33	445	20	13	61	39	231	214	52	48
14-Jul	40	485	11	29	28	73	242	243	50	50
15-Jul	66	551	31	35	47	53	273	278	50	50
17-Jul	68	619	36	32	53	47	309	310	50	50
18-Jul	40	659	10	30	25	75	319	340	48	52
21-Jul	23	682	14	9	61	39	333	349	49	51
22-Jul	10	692	5	5	50	50	338	354	49	51
23-Jul	51	743	16	35	31	69	354	389	48	52
28-Jul	43	786	19	24	44	56	373	413	47	53
29-Jul	14	800	8	6	57	43	381	419	48	52
30-Jul	18	818	9	9	50	50	390	428	48	52
31-Jul	19	837	6	13	32	68	396	441	47	53
1-Aug	21	858	6	15	29	71	402	456	47	53
5-Aug	3	861	1	2	33	67	403	458	47	53
8-Aug	1	862	1	0	100	0	404	458	47	53
11-Aug	1	863	0	1	0	100	404	459	47	53
12-Aug	2	865	0	2	0	100	404	461	47	53

Table 10. Age and sex composition of Kanektok River sockeye salmon escapement, 1997.

		Brood Year and Age Group [a]								
		1994		1993		1992			1991	
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	6/19-6/26									
Sampling Dates:	6/19, 6/22, 6/24-6/26									
Sample Size:	46									
Male	Percent of Sample			2.2	6.5	6.5	34.8		2.2	2.2
	Escapement			109	326	326	1,737		109	108
Female	Percent of Sample			8.7	2.2		26.1		2.1	6.5
	Escapement			434	108		1,302		108	326
Total	Percent of Sample			10.9	8.7	6.5	60.9		4.3	8.7
	Escapement			543	434	326	3,039		217	434
Stratum Dates:	6/27-7/03									
Sampling Dates:	6/28, 6/30, 7/01									
Sample Size:	143									
Male	Percent of Sample			2.8	4.2	2.1	35.0		2.1	3.5
	Escapement			548	821	410	6,842		411	684
Female	Percent of Sample			2.8	2.1	4.2	34.9		3.5	2.8
	Escapement			547	410	821	6,841		684	547
Total	Percent of Sample			5.6	6.3	6.3	69.9		5.6	6.3
	Escapement			1,095	1,231	1,231	13,683		1,095	1,231
Stratum Dates:	7/04-7/11									
Sampling Dates:	7/05-7/06, 7/08-7/09									
Sample Size:	181									
Male	Percent of Sample			5.0	8.1	1.6	35.9	0.6	2.2	3.9
	Escapement			1,800	2,274	620	13,437	207	827	1,447
Female	Percent of Sample	0.6	0.6		7.7	2.8	27.6		1.7	3.8
	Escapement	207	207		2,894	1,034	10,336		620	1,447
Total	Percent of Sample	0.6	0.6	5.0	13.8	4.4	63.5	0.6	3.9	7.7
	Escapement	207	207	1,860	5,168	1,654	23,773	207	1,447	2,694
Stratum Dates:	7/12-7/19									
Sampling Dates:	7/14-7/15, 7/17-7/18									
Sample Size:	193									
Male	Percent of Sample			3.6	16.0	0.5	20.2			1.5
	Escapement			776	3,436	111	4,324			333
Female	Percent of Sample		0.5	1.6	30.6	1.6	18.7		2.6	2.6
	Escapement		111	333	6,541	332	3,991		554	554
Total	Percent of Sample		0.5	5.2	46.6	2.1	38.9		2.6	4.1
	Escapement		111	1,109	9,977	443	8,315		554	887

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Table 10. (page 2 of 2).

		Brood Year and Age Group [a]								
		1994		1993		1992			1991	
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	7/20-7/25									
Sampling Dates:	7/21-7/23									
Sample Size:	66									
Male	Percent of Sample			4.6	15.2	1.5	13.6		3.1	3.0
	Escapement			327	1,090	109	981		218	218
Female	Percent of Sample			1.5	30.3		18.2	1.5	3.0	4.6
	Escapement			109	2,180		1,308	109	218	327
Total	Percent of Sample			6.1	45.5	1.5	31.8	1.5	6.1	7.6
	Escapement			436	3,270	109	2,289	109	436	545
Stratum Dates:	7/26-8/20									
Sampling Dates:	7/28-7/31, 8/01, 8/05, 8/08, 8/11-8/12									
Sample Size:	111									
Male	Percent of Sample			0.9	16.2	1.8	16.2	0.9	2.7	0.9
	Escapement			54	967	107	967	54	161	54
Female	Percent of Sample			0.9	40.6		12.6	0.9	2.7	2.7
	Escapement			53	2,418		752	53	161	161
Total	Percent of Sample			1.8	56.8	1.8	28.8	1.8	5.4	3.6
	Escapement			107	3,385	107	1,719	107	322	215
Stratum Dates:	Season [b]									
Sample Size:	740									
Male	Percent of Sample			3.8	9.2	1.7	29.3	0.3	1.8	2.9
	Escapement			3,673	8,914	1,684	28,286	260	1,725	2,844
Female	Percent of Sample	0.2	0.3	1.5	15.1	2.3	25.4	0.1	2.4	3.5
	Escapement	207	318	1,477	14,552	2,187	24,531	163	2,346	3,362
Total	Percent of Sample	0.2	0.3	5.3	24.3	4.0	54.7	0.4	4.2	6.4
	Escapement	207	318	5,150	23,466	3,871	52,817	423	4,071	6,206

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are attrib to rounding.

[b] The number of fish in "Season" summaries are the stratum sums; "Season" percentages are derived from the sums.

Table 11. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Kanektok River sockeye salmon escapement samples, 1997.

		Brood Year and Age Group								
		1994		1993		1992			1991	
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	6/19-6/26									
Sample Size:	46									
Male	Mean Length			585	489	611	581		585	610
	Std. Error			-	46	14	6		-	-
	Range			585-585	398-548	588-635	539-612		585-585	610-610
	Sample Size			1	3	3	16		1	1
Female	Mean Length			540	455		558		598	534
	Std. Error			6	-		9		-	20
	Range			525-552	455-455		495-597		598-598	495-558
	Sample Size			4	1		12		1	3
Stratum Dates:	6/27-7/03									
Sample Size:	143									
Male	Mean Length			562	522	631	595		602	605
	Std. Error			18	19	31	4		11	2
	Range			510-590	440-569	572-675	528-655		583-620	600-610
	Sample Size			4	6	3	50		3	5
Female	Mean Length			562	521	598	559		571	545
	Std. Error			8	24	17	3		9	5
	Range			550-582	485-567	557-678	510-610		542-600	530-555
	Sample Size			4	3	6	50		5	4
Stratum Dates:	7/04-7/11									
Sample Size:	181									
Male	Mean Length			582	532	604	593	540	623	591
	Std. Error			14	5	10	3	-	8	10
	Range			487-637	505-558	585-617	518-640	540-540	605-645	550-622
	Sample Size			9	11	3	65	1	4	7
Female	Mean Length	473	482		511	592	556		579	547
	Std. Error	-	-		8	8	3		12	5
	Range	73-473	482-482		460-595	564-611	504-594		560-600	532-570
	Sample Size	1	1		14	5	50		3	7
Stratum Dates:	7/12-7/19									
Sample Size:	193									
Male	Mean Length			584	525	620	576			544
	Std. Error			11	6	-	5			15
	Range			555-645	430-598	620-620	500-660			515-560
	Sample Size			7	31	1	39			3
Female	Mean Length		330	513	501	570	551		570	551
	Std. Error		-	9	4	9	4		13	17
	Range		330-330	530-530	435-606	553-580	520-607		535-600	500-590
	Sample Size		1	3	59	3	36		5	5

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Table 11. (page 2 of 2).

		Brood Year and Age Group								
		1994		1993		1992			1991	
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	7/20-7/25									
Sample Size:	66									
Male	Mean Length			615	533	620	576		573	607
	Std. Error			25	13	-	12		23	24
	Range			590-666	473-590	620-620	535-630		550-595	583-630
	Sample Size			3	10	1	9		2	2
Female	Mean Length			530	503		550	480	578	545
	Std. Error			-	8		6	-	3	16
	Range			530-530	450-587		520-570	480-480	575-580	512-562
	Sample Size			1	20		12	1	2	3
Stratum Dates:	7/26-8/20									
Sample Size:	111									
Male	Mean Length			638	516	608	577	536	592	557
	Std. Error			-	6	13	7	-	11	-
	Range			638-638	485-570	595-620	498-655	536-536	570-605	557-557
	Sample Size			1	18	2	18	1	3	1
Female	Mean Length			520	484		541	480	568	541
	Std. Error			-	4		6	-	7	10
	Range			520-520	427-575		502-575	480-480	555-578	530-562
	Sample Size			1	45		14	1	3	3
Stratum Dates:	Season [a]									
Sample Size:	740									
Male	Mean Length			583	525	614	589	539	606	590
	Range			487-668	398-598	572-675	498-660	536-540	550-645	515-630
	Sample Size			25	79	13	197	2	13	19
Female	Mean Length	473	429	541	501	591	555	480	575	546
	Range	473-473	330-482	500-582	427-606	553-678	495-610	480-480	535-600	495-590
	Sample Size	1	2	13	142	14	174	2	19	25

[a] Season mean lengths are weighted by the escapement passage in each stratum.

Table 12. Sex composition of Kanektok River chum salmon escapement samples, 1997.

Date	Sample Size		Daily Sex Composition		Daily Percentage Sex Composition		Cumulative Sex Composition		Cum Percentage Sex Composition	
	Daily	Cum	Male	Female	Male	Female	Male	Female	Male	Female
19-Jun	4	4	4	0	100	0	4	0	100	0
22-Jun	24	28	16	8	67	33	20	8	71	29
24-Jun	11	39	6	5	55	45	26	13	67	33
25-Jun	49	88	22	27	45	55	48	40	55	45
26-Jun	10	98	10	0	100	0	58	40	59	41
28-Jun	26	124	18	8	69	31	76	48	61	39
30-Jun	123	247	75	48	61	39	151	96	61	39
05-Jul	58	305	30	28	52	48	181	124	59	41
06-Jul	56	361	40	16	71	29	221	140	61	39
08-Jul	86	447	52	34	60	40	273	174	61	39
09-Jul	10	457	8	2	80	20	281	176	61	39
14-Jul	120	577	73	47	61	39	354	223	61	39
15-Jul	94	671	52	42	55	45	406	265	61	39
21-Jul	85	756	45	40	53	47	451	305	60	40
22-Jul	61	817	27	34	44	56	478	339	59	41
23-Jul	64	881	37	27	58	42	515	366	58	42
28-Jul	60	941	36	24	60	40	551	390	59	41
29-Jul	48	989	22	26	46	54	573	416	58	42
30-Jul	29	1,018	13	16	45	55	586	432	58	42
31-Jul	47	1,065	27	20	57	43	613	452	58	42
1-Aug	26	1,091	14	12	54	46	627	464	57	43
5-Aug	23	1,114	12	11	52	48	639	475	57	43
8-Aug	5	1,119	2	3	40	60	641	478	57	43
11-Aug	20	1,139	9	11	45	55	650	489	57	43
12-Aug	7	1,146	4	3	57	43	654	492	57	43
18-Aug	4	1,150	1	3	25	75	655	495	57	43
19-Aug	2	1,152	0	2	0	100	655	497	57	43

Table 13. Age and sex composition of Kanektok River chum salmon escapement, 1997.

		Brood Year and Age Group [a]			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	6/11-6/22				
Sampling Dates:	6/19, 6/22				
Sample Size:	26				
Male	Percent of Sample			73.1	
	Escapement			1,188	
Female	Percent of Sample		3.8	23.1	
	Escapement		63	375	
Total	Percent of Sample		3.8	96.2	
	Escapement		63	1,563	
Stratum Dates:	6/23-6/26				
Sampling Dates:	6/24-6/26				
Sample Size:	68				
Male	Percent of Sample		4.4	50.0	
	Escapement		106	1,203	
Female	Percent of Sample		5.9	36.8	2.9
	Escapement		142	885	71
Total	Percent of Sample		10.3	86.8	2.9
	Escapement		248	2,088	71
Stratum Dates:	6/27-7/02				
Sampling Dates:	6/28, 6/30				
Sample Size:	139				
Male	Percent of Sample		8.6	51.8	2.2
	Escapement		678	4,071	170
Female	Percent of Sample		5.1	32.4	
	Escapement		396	2,545	
Total	Percent of Sample		13.7	84.2	2.2
	Escapement		1,074	6,616	170
Stratum Dates:	7/03-7/06				
Sampling Dates:	7/05-7/06				
Sample Size:	107				
Male	Percent of Sample		12.1	49.5	3.7
	Escapement		1,037	4,226	319
Female	Percent of Sample		10.3	24.3	
	Escapement		877	2,073	
Total	Percent of Sample		22.4	73.8	3.7
	Escapement		1,914	6,299	319

-Continued-

Table 13. (page 2 of 3).

		Brood Year and Age Group [a]			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	7/07-7/11				
Sampling Dates:	7/08-7/09				
Sample Size:	96				
Male	Percent of Sample		15.6	46.9	
	Escapement		842	2,526	
Female	Percent of Sample		12.5	25.0	
	Escapement		673	1,347	
Total	Percent of Sample		28.1	71.9	
	Escapement		1,515	3,873	
Stratum Dates:	7/12-7/17				
Sampling Dates:	7/14-7/15				
Sample Size:	206				
Male	Percent of Sample	0.5	16.0	41.3	0.5
	Escapement	36	1,193	3,072	36
Female	Percent of Sample	0.5	14.6	26.2	0.5
	Escapement	36	1,084	1,952	36
Total	Percent of Sample	1.0	30.6	67.5	1.0
	Escapement	72	2,277	5,024	72
Stratum Dates:	7/18-7/25				
Sampling Dates:	7/21-7/23				
Sample Size:	188				
Male	Percent of Sample		24.5	26.6	1.1
	Escapement		1,896	2,060	83
Female	Percent of Sample	1.1	29.8	17.0	
	Escapement	83	2,307	1,318	
Total	Percent of Sample	1.1	54.3	43.6	1.1
	Escapement	83	4,203	3,378	83
Stratum Dates:	7/26-8/03				
Sampling Dates:	7/28-8/01				
Sample Size:	207				
Male	Percent of Sample	1.0	30.4	21.7	
	Escapement	68	2,127	1,519	
Female	Percent of Sample	1.9	27.6	16.9	0.5
	Escapement	135	1,925	1,182	34
Total	Percent of Sample	2.9	58.0	38.6	0.5
	Escapement	203	4,052	2,701	34

-Continued-

Table 13. (page 3 of 3).

		Brood Year and Age Group [a]			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	8/04-8/09				
Sampling Dates:	8/05, 8/08				
Sample Size:	27				
Male	Percent of Sample	3.7	40.8	7.4	
	Escapement	82	900	164	
Female	Percent of Sample		33.3	14.8	
	Escapement		736	327	
Total	Percent of Sample	3.7	74.1	22.2	
	Escapement	82	1,636	491	
Stratum Dates:	8/10-8/21				
Sampling Dates:	8/11-8/12, 8/18-8/19				
Sample Size:	32				
Male	Percent of Sample	3.1	25.0	15.6	
	Escapement	31	251	156	
Female	Percent of Sample		50.0	6.3	
	Escapement		501	63	
Total	Percent of Sample	3.1	75.0	21.9	
	Escapement	31	752	219	
Stratum Dates:	Season [b]				
Sample Size:	1,096				
Male	Percent of Sample	0.4	17.6	39.4	1.2
	Escapement	217	9,027	20,190	607
Female	Percent of Sample	0.5	17.0	23.6	0.3
	Escapement	253	8,701	12,069	141
Total	Percent of Sample	0.9	34.6	63.0	1.5
	Escapement	470	17,728	32,259	748

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are attributed to rounding.

[b] The number of fish in "Season" summaries are the stratum sums; "Season" percentages are derived from the sums.

Table 14. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Kanektok River chum salmon escapement samples, 1997.

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	6/11-6/22				
Sample Size:	26				
Male	Mean Length			631	
	Std. Error			5	
	Range			575-665	
	Sample Size			19	
Female	Mean Length		569	578	
	Std. Error		-	7	
	Range		569-569	559-604	
	Sample Size		1	6	
Stratum Dates:	6/23-6/26				
Sample Size:	68				
Male	Mean Length		580	620	
	Std. Error		5	5	
	Range		570-585	565-668	
	Sample Size		3	34	
Female	Mean Length		581	587	597
	Std. Error		15	4	4
	Range		545-610	543-628	593-600
	Sample Size		4	25	2
Stratum Dates:	6/27-7/02				
Sample Size:	139				
Male	Mean Length		605	631	626
	Std. Error		9	4	34
	Range		557-655	520-700	562-680
	Sample Size		12	72	3
Female	Mean Length		594	599	
	Std. Error		11	5	
	Range		562-640	540-677	
	Sample Size		7	45	
Stratum Dates:	7/03-7/06				
Sample Size:	107				
Male	Mean Length		587	621	626
	Std. Error		7	4	9
	Range		550-628	552-690	605-648
	Sample Size		13	53	4
Female	Mean Length		548	580	
	Std. Error		9	4	
	Range		487-598	528-624	
	Sample Size		11	26	

-Continued-

Table 14. (page 2 of 3).

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	7/07-7/11				
Sample Size:	96				
Male	Mean Length		589	621	
	Std. Error		8	5	
	Range		542-646	565-695	
	Sample Size		15	45	
Female	Mean Length		560	594	
	Std. Error		8	4	
	Range		483-593	558-635	
	Sample Size		12	24	
Stratum Dates:	7/12-7/17				
Sample Size:	206				
Male	Mean Length	520	579	601	597
	Std. Error	-	5	3	-
	Range	520-520	510-648	515-680	597-597
	Sample Size	1	33	85	1
Female	Mean Length	523	549	573	575
	Std. Error	-	4	4	-
	Range	523-523	500-590	510-685	575-575
	Sample Size	1	30	54	1
Stratum Dates:	7/18-7/25				
Sample Size:	188				
Male	Mean Length		577	602	595
	Std. Error		4	5	-
	Range		527-650	515-680	595-595
	Sample Size		46	50	2
Female	Mean Length	567	554	575	
	Std. Error	57	3	4	
	Range	510-623	503-608	525-615	
	Sample Size	2	56	32	
Stratum Dates:	7/26-8/03				
Sample Size:	207				
Male	Mean Length	505	577	602	
	Std. Error	20	4	5	
	Range	485-525	505-670	540-665	
	Sample Size	2	63	45	
Female	Mean Length	533	543	558	610
	Std. Error	27	4	4	-
	Range	485-605	480-608	490-615	610-610
	Sample Size	4	57	35	1

-Continued-

Table 14. (page 3 of 3).

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	8/04-8/09				
Sample Size:	27				
Male	Mean Length	580	585	596	
	Std. Error	-	11	28	
	Range	580-580	527-638	568-624	
	Sample Size	1	11	2	
Female	Mean Length		544	550	
	Std. Error		9	16	
	Range		500-596	521-578	
	Sample Size		9	4	
Stratum Dates:	8/10-8/21				
Sample Size:	32				
Male	Mean Length	520	582	601	
	Std. Error	-	8	13	
	Range	520-520	547-620	560-635	
	Sample Size	1	8	5	
Female	Mean Length		520	560	
	Std. Error		6	20	
	Range		475-580	540-580	
	Sample Size		16	2	
Stratum Dates:	Season				
Sample Size:	1,096				
Male	Mean Length	538	583	617	620
	Range	485-580	505-670	515-700	562-680
	Sample Size	5	204	410	10
Female	Mean Length	542	550	581	594
	Range	485-623	475-640	490-685	575-610
	Sample Size	7	203	253	4

Table 15. Sex composition of Kanektok River coho salmon escapement samples, 1997.

Date	Sample Size		Daily Sex Composition		Daily Percentage Sex Composition		Cumulative Sex Composition		Cum Percentage Sex Composition	
	Daily	Cum	Male	Female	Male	Female	Male	Female	Male	Female
5-Aug	10	10	6	4	60	40	6	4	60	40
8-Aug	4	14	3	1	75	25	9	5	64	36
11-Aug	74	88	48	26	65	35	57	31	65	35
12-Aug	78	166	46	32	59	41	103	63	62	38
18-Aug	54	220	21	33	39	61	124	96	56	44
19-Aug	45	265	23	22	51	49	147	118	55	45
20-Aug	62	327	39	23	63	37	186	141	57	43

Table 16. Age and sex composition of Kanektok River coho salmon escapement, 1997.

		Brood Year and Age Group [a]		
		1994	1993	1992
		1.1	2.1	3.1
Stratum Dates:	7/28-8/15			
Sampling Dates:	8/05-8/08, 8/11-8/12			
Sample Size:	166 [b]			
Male	Percent of Sample			
	Escapement			
Female	Percent of Sample			
	Escapement			
Total	Percent of Sample			
	Escapement			
Stratum Dates:	8/16-8/21			
Sampling Dates:	8/18-8/20			
Sample Size:	115			
Male	Percent of Sample	1.3	45.9	4.0
	Escapement	116	3,980	351
Female	Percent of Sample		48.7	
	Escapement		4,222	
Total	Percent of Sample	1.3	94.6	4.0
	Escapement	116	8,202	351
Stratum Dates:	Season [c]			
Sample Size:	281			
Male	Percent of Sample	1.3	45.9	4.0
	Escapement	310	10,638	938
Female	Percent of Sample		48.7	
	Escapement		11,286	
Total	Percent of Sample	1.3	94.6	4.0
	Escapement	310	21,924	938

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are due to rounding.

[b] Sex and length information was recorded, but no scales were collected.

[c] The age and sex information from stratum 2 was used to estimate the number of fish by age and sex.

Table 17. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Kanektok River coho salmon escapement samples, 1997.

		Brood Year and Age Group		
		1994	1993	1992
		1.1	2.1	3.1
Stratum Dates:	7/28-8/15	All lengths for this stratum are by sex only; fish were not aged.		
Sample Size:	166 [a]			
Male	Mean Length		581	
	Std. Error		4	
	Range		460-655	
	Sample Size		103	
Female	Mean Length		597	
	Std. Error		4	
	Range		450-640	
	Sample Size		63	
Stratum Dates:	8/16-8/20			
Sample Size:	115			
Male	Mean Length	590	582	642
	Std. Error	-	8	19
	Range	590-590	465-645	605-665
	Sample Size	1	34	3
Female	Mean Length		604	
	Std. Error		5	
	Range		540-658	
	Sample Size		23	

[a] Sex and length information was recorded; no scales were collected.

Table 18. Kanektok River aerial surveys by species, 1962-1997.

Year[a]	Chinook	Sockeye	Chum	Coho
1962	935	43,108		
1963				
1964				
1965				
1966	3,718		28,800	
1967				
1968	4,170	8,000	14,000	
1969				
1970	4,112	3,028	80,100	
1971				
1972				
1973	814			
1974				
1975		6,018		
1976		2,936	8,697	
1977	5,787	6,304	32,157	
1978	19,180 [b]	44,215	229,290	
1979				
1980	6,172	113,931	23,950	69,325
1981	15,900 [c]	49,175 [c]	71,840 [c]	
1982	[d]	8,142 [d]	55,940 [d]	
1983	8,890	2,340	9,360	
1984	12,182	30,840	48,360	46,830 [e]
1985	13,465	16,270	14,385	
1986	3,643	14,949	16,790	
1987	4,223	51,753	9,420	20,056
1988	11,140	30,440	20,063	
1989	7,914	14,735	6,270	
1990	2,563	32,082	2,475	
1991	2,100 [d]	43,500 [d]	18,000 [d]	4,330
1992	3,856	14,955	25,675 [f]	
1993	4,670	23,128	1,285	
1994	7,386	30,090	10,000 [g]	
1995	[h]	[h]	16,272	2,250
1996	6,107	30,000	7,040	23,656
1997	7,990 [i]	27,100 [i]	3,270 [i]	5,192 [i]
10-Year Average	5,360	28,563	11,650	
BEG	**5,000**	**15,000**	**30,500**	

[a] Peak aerial surveys are those rated fair or good surveys obtained between 20 July and 5 August for chinook and sockeye salmon, 20-31 July for chum salmon, and 20 August and 5 September for coho salmon. Years are footnoted when some or all surveys did not meet these criteria.

[b] Chum salmon count excluded from escapement objective calculation due to exceptional magnitude.

[c] Poor survey for chinook, sockeye, chum salmon.

[d] Late survey for chinook, sockeye salmon (after 5 August).

[e] Poor coho survey.

[f] Some chum may have been sockeye.

[g] Chum count not at peak, estimate made during chinook survey.

[h] Partial survey rated poor.

[i] Chinook, chum, and sockeye numbers from 2 August. Chum count not at peak. Coho survey done on 1 October also not at peak.

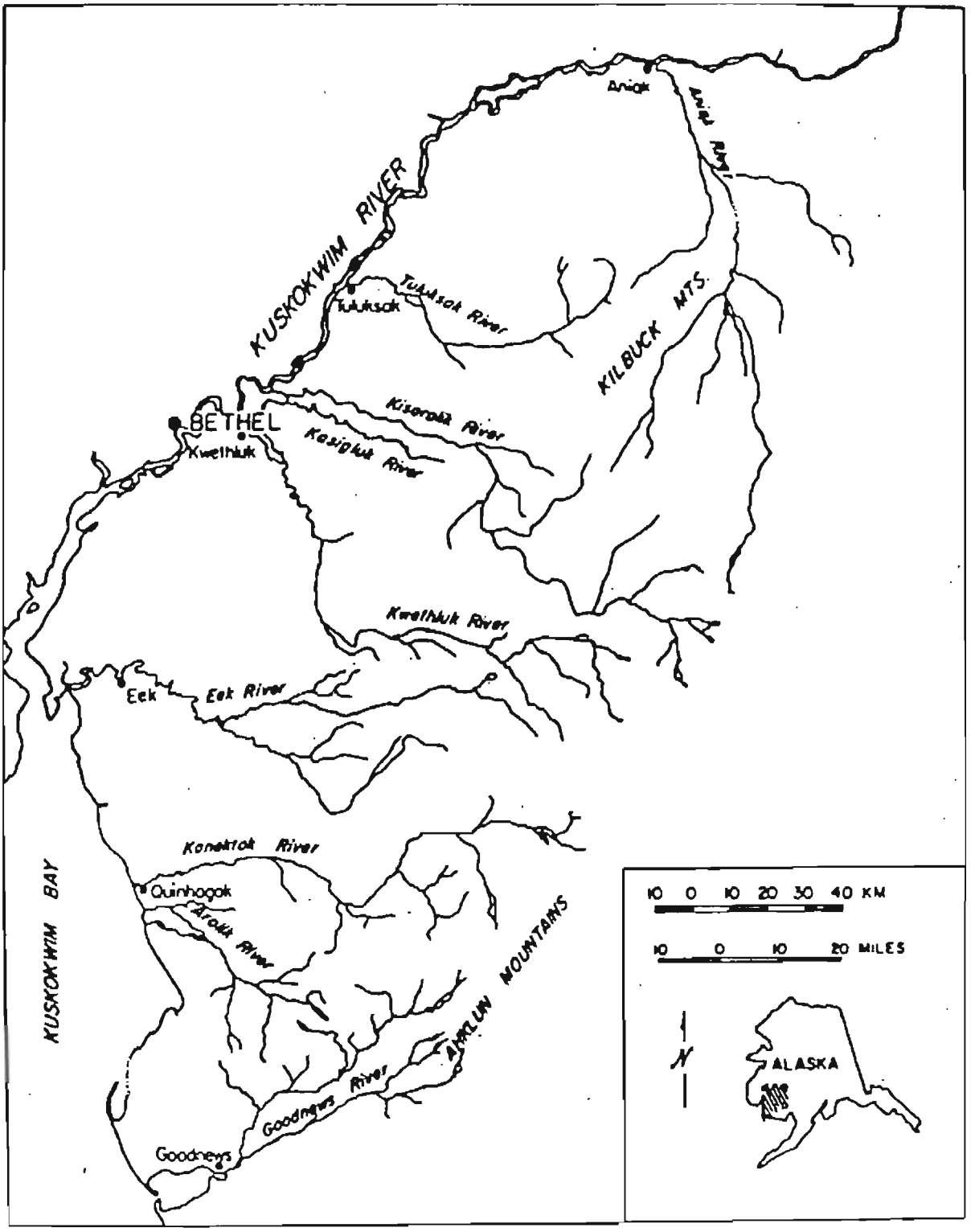
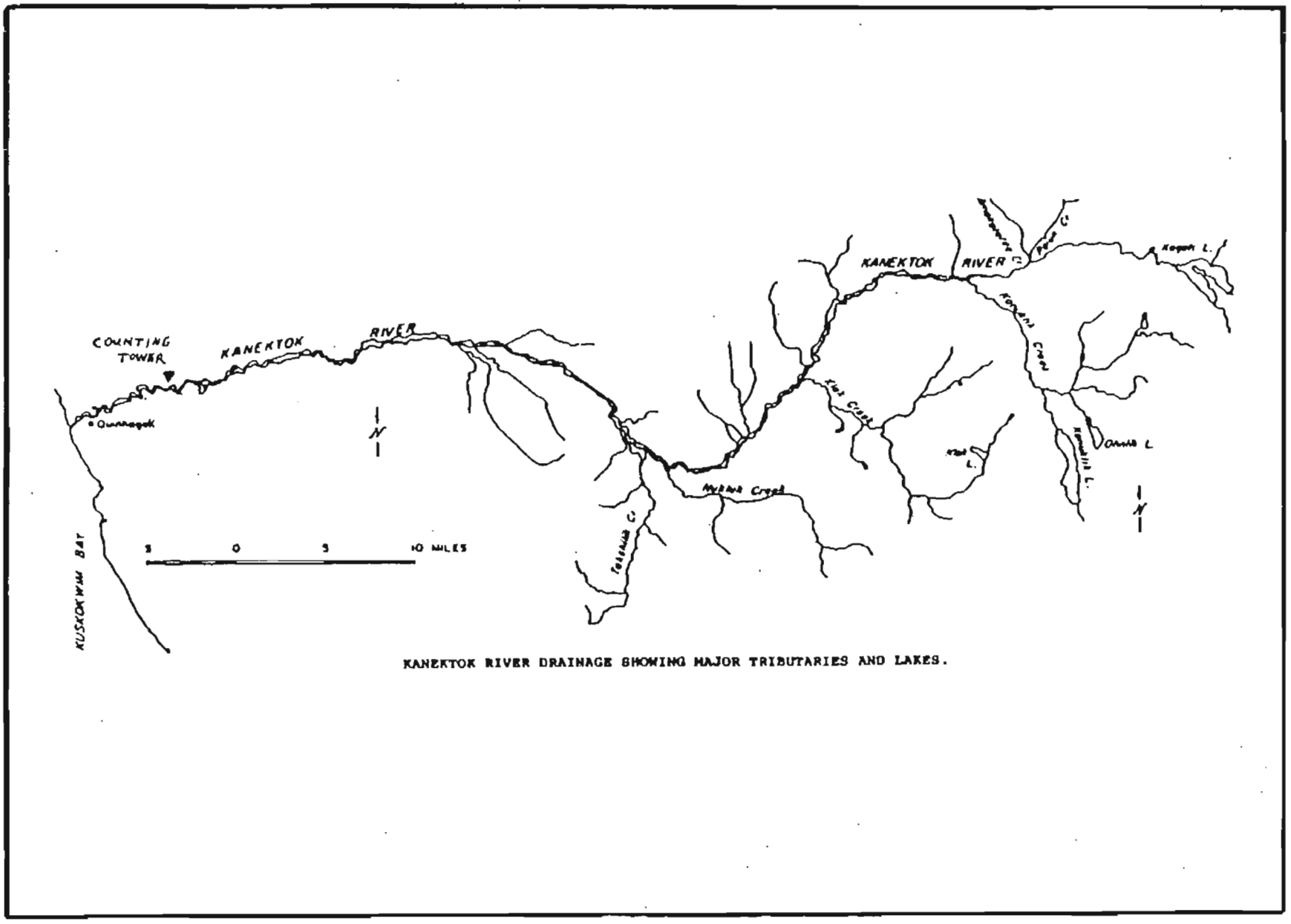


Figure 1. Kuskokwim Area, Southwestern Alaska.



KANEKTOK RIVER DRAINAGE SHOWING MAJOR TRIBUTARIES AND LAKES.

Figure 2. Kanektok River drainage.

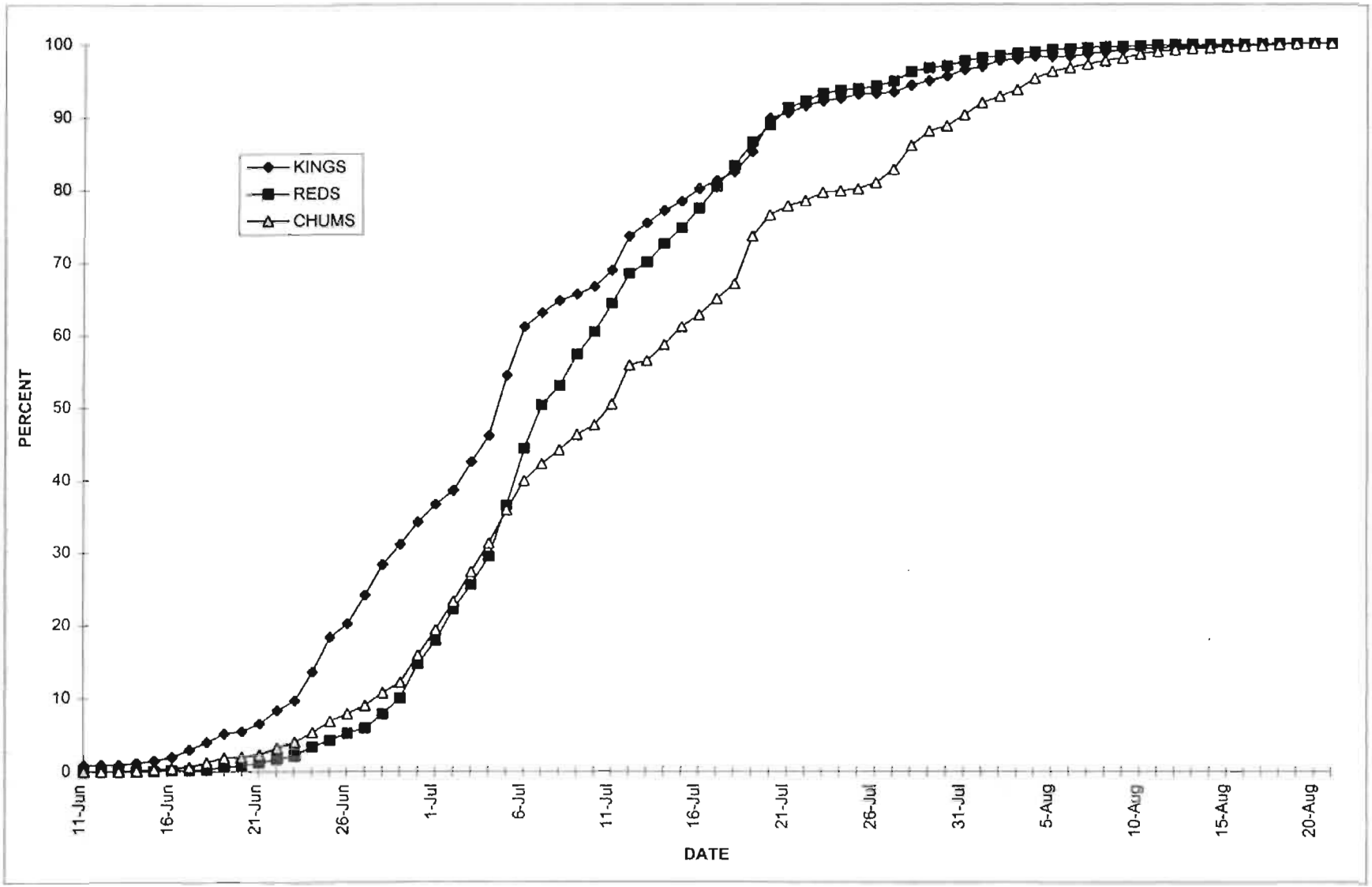


Figure 3. Cumulative percentage (estimated) of run past Kanektok River tower.

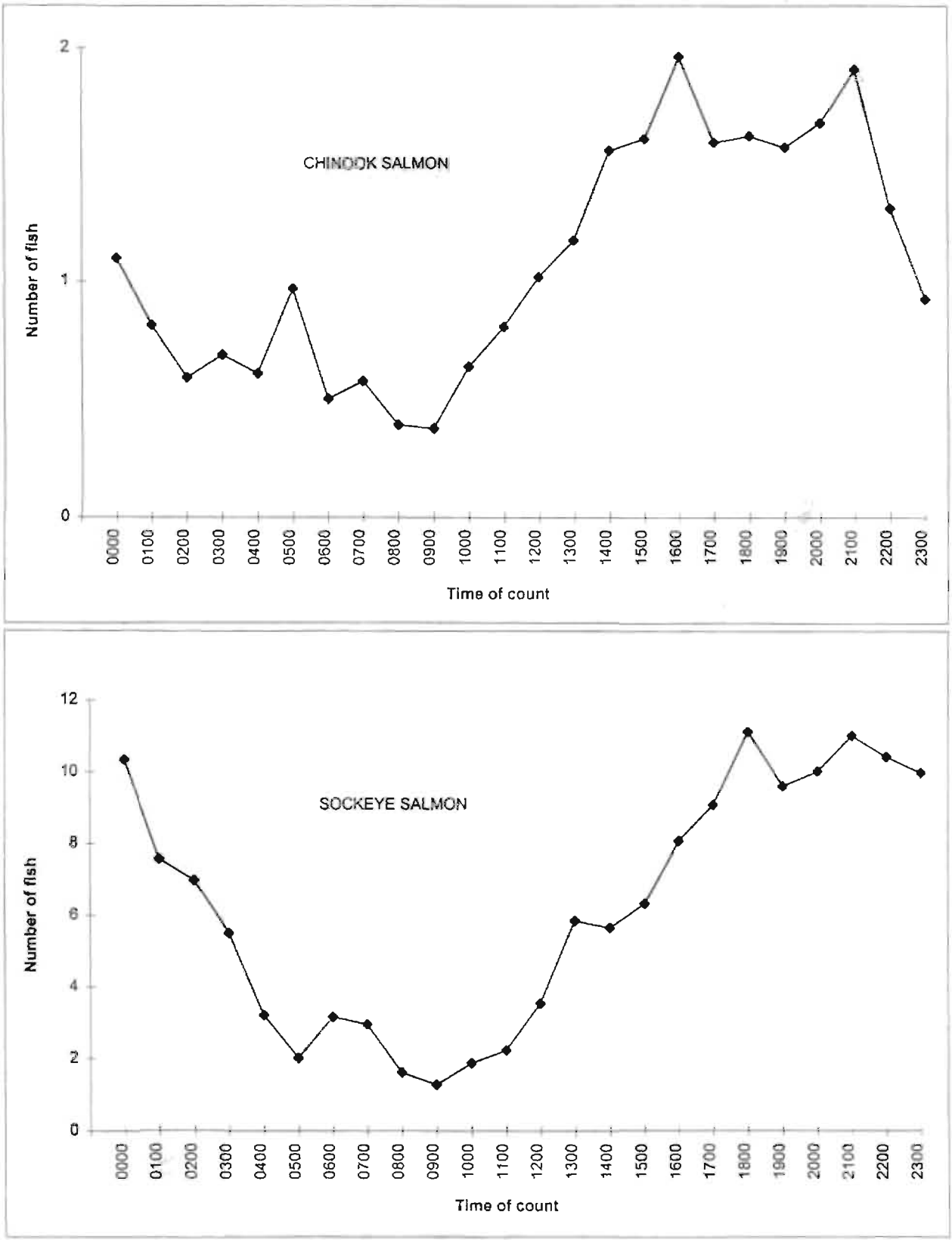


Figure 4. Average actual count (unexpanded) of chinook and sockeye salmon by hour of day.

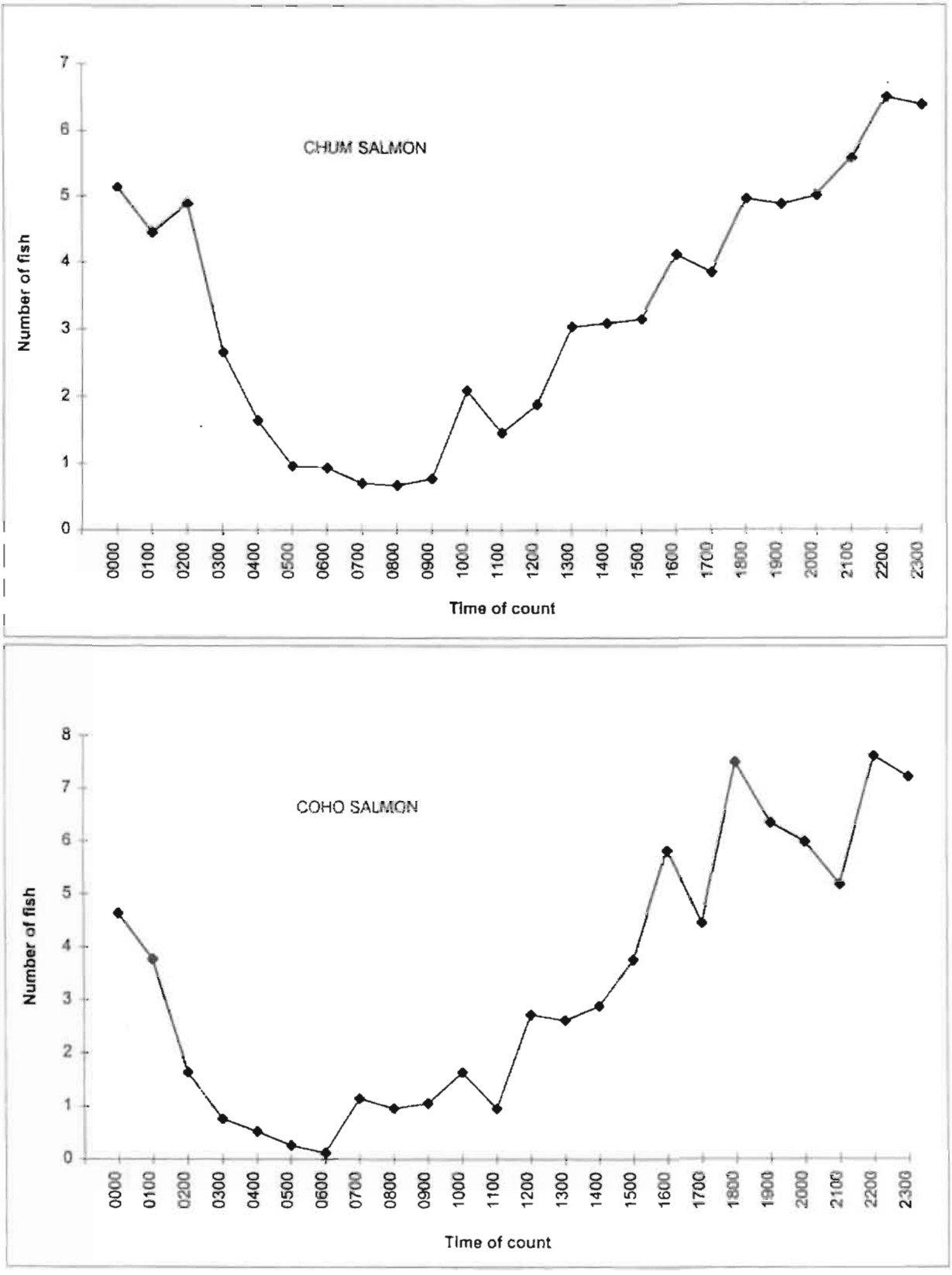


Figure 5. Average actual count (unexpanded) of chum and coho salmon by hour of day.

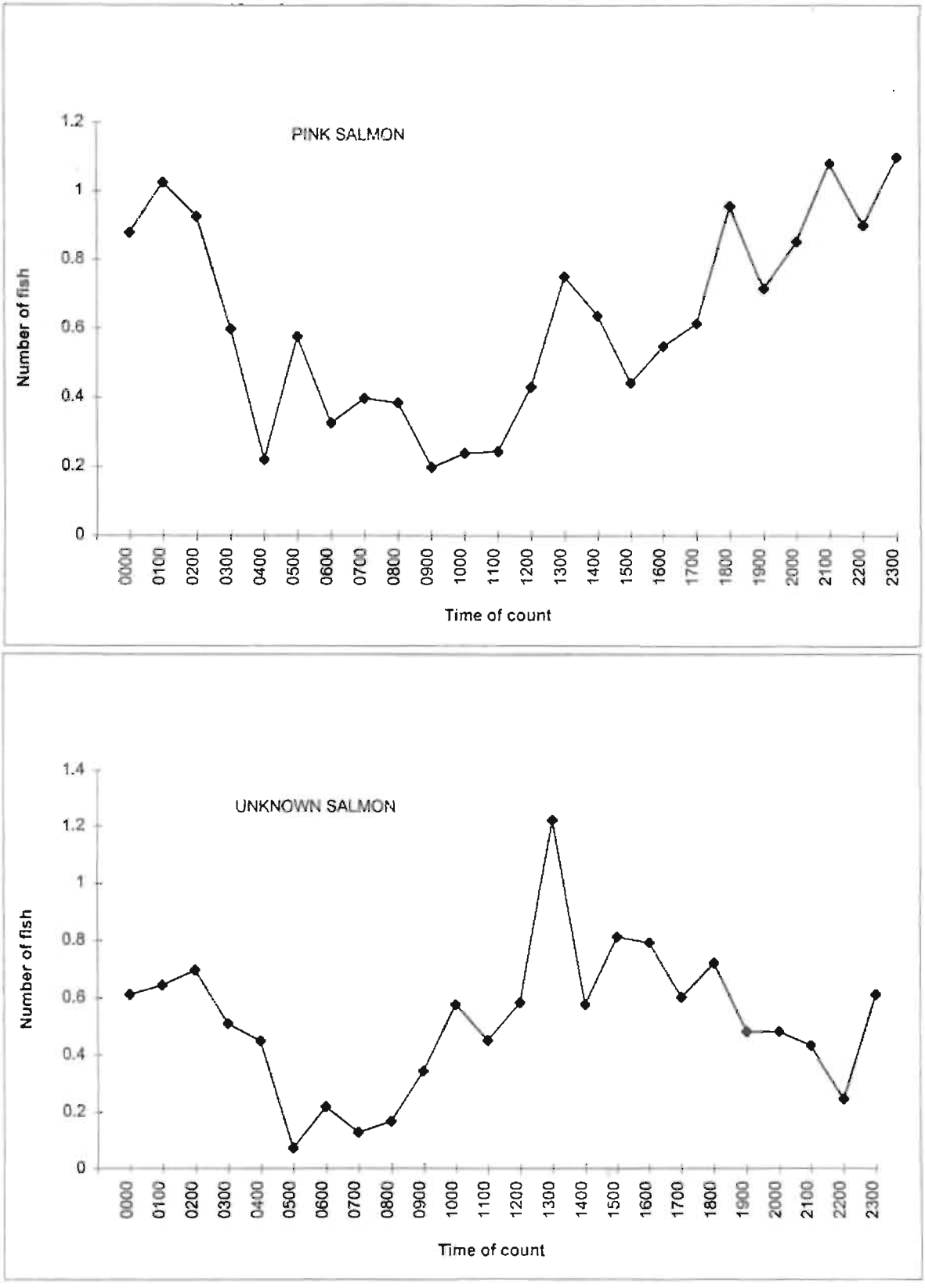


Figure 6. Average actual count (unexpanded) of pink and unknown salmon by hour of day.

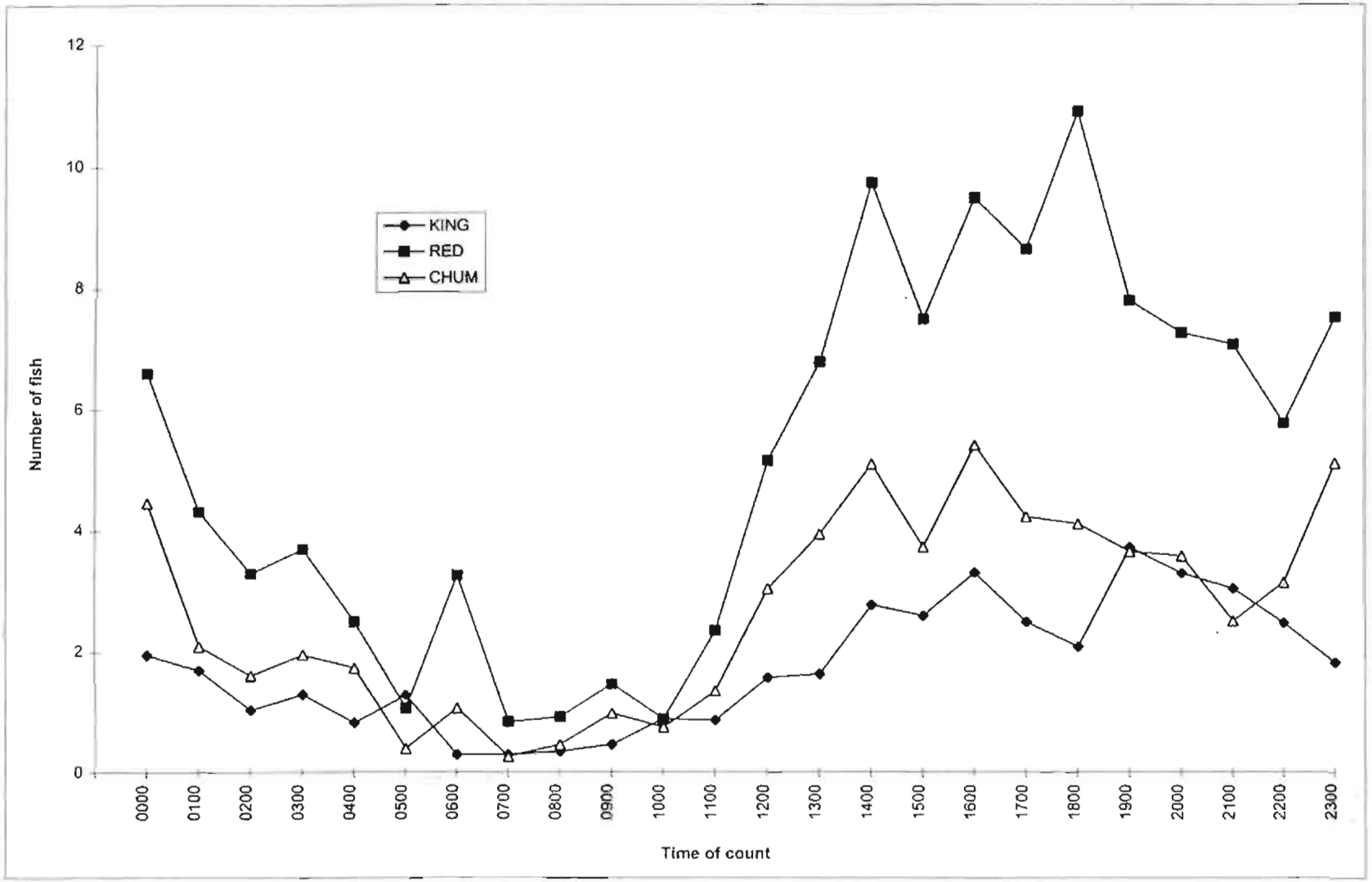


Figure 7. Average actual count (unexpanded) by hour of day for counts in June.

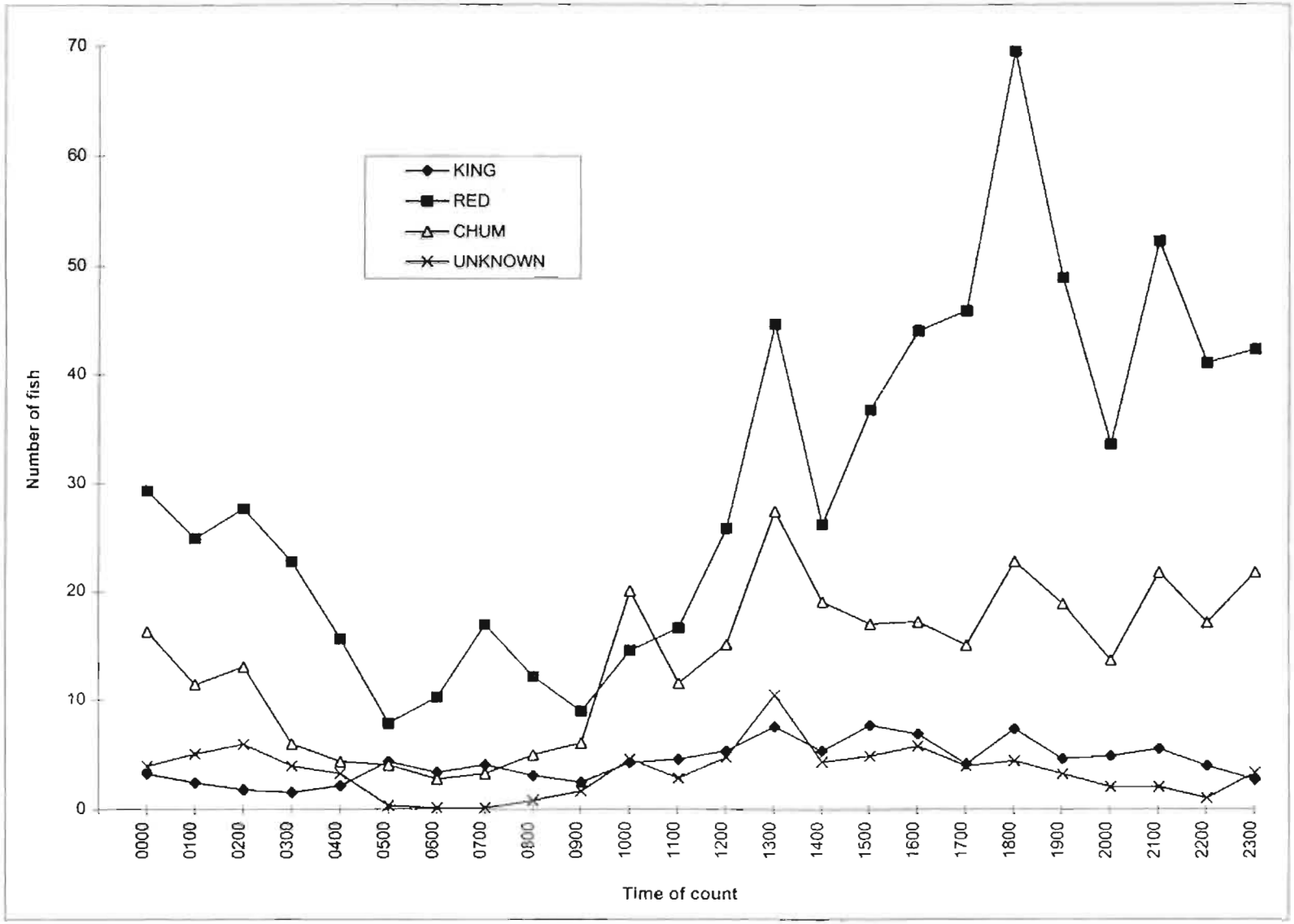


Figure 8. Average actual count (unexpanded) by hour of day for counts from 30 June to 6 July.

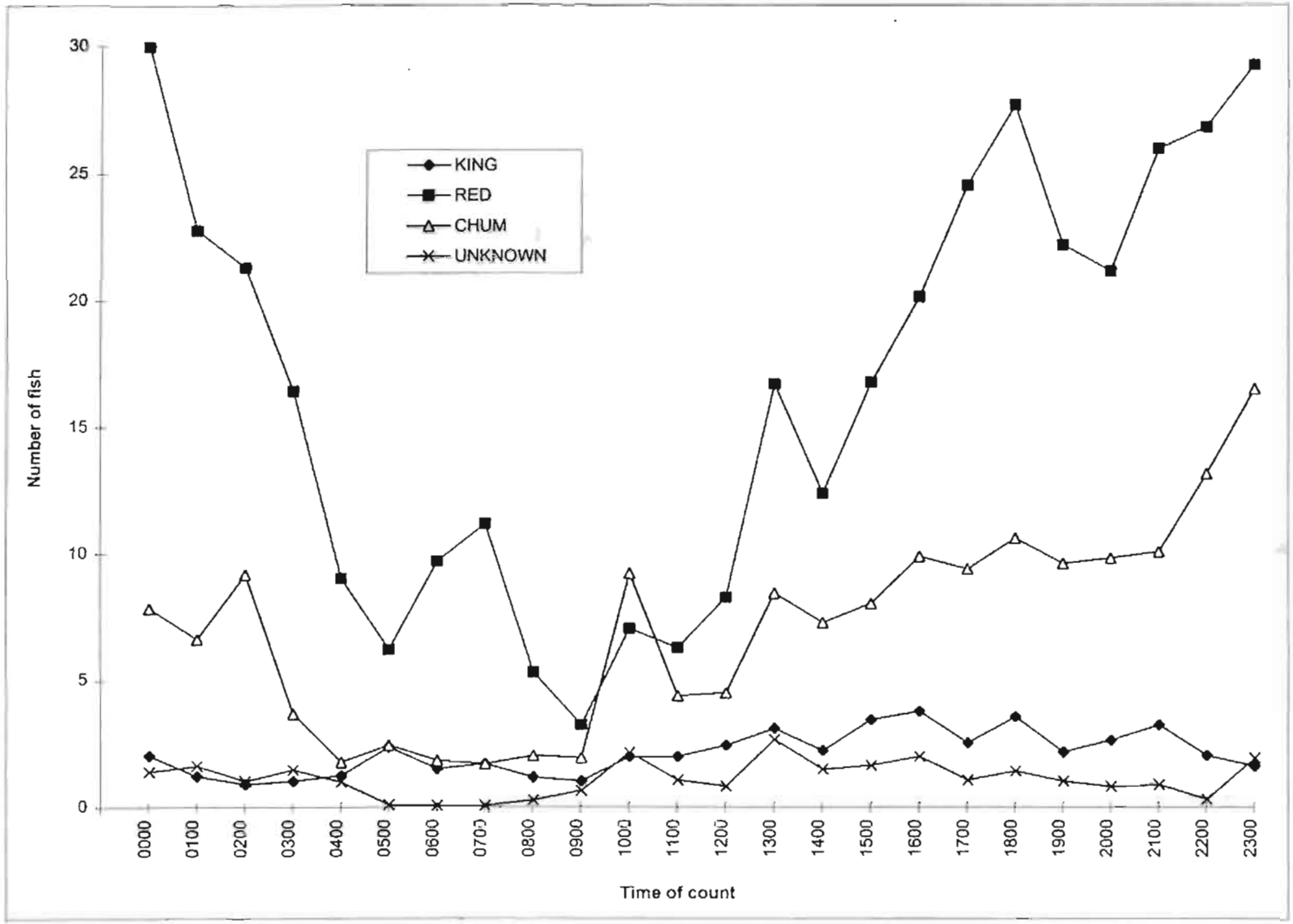


Figure 9. Average actual count (unexpanded) by hour of day for counts from 1 to 15 July.

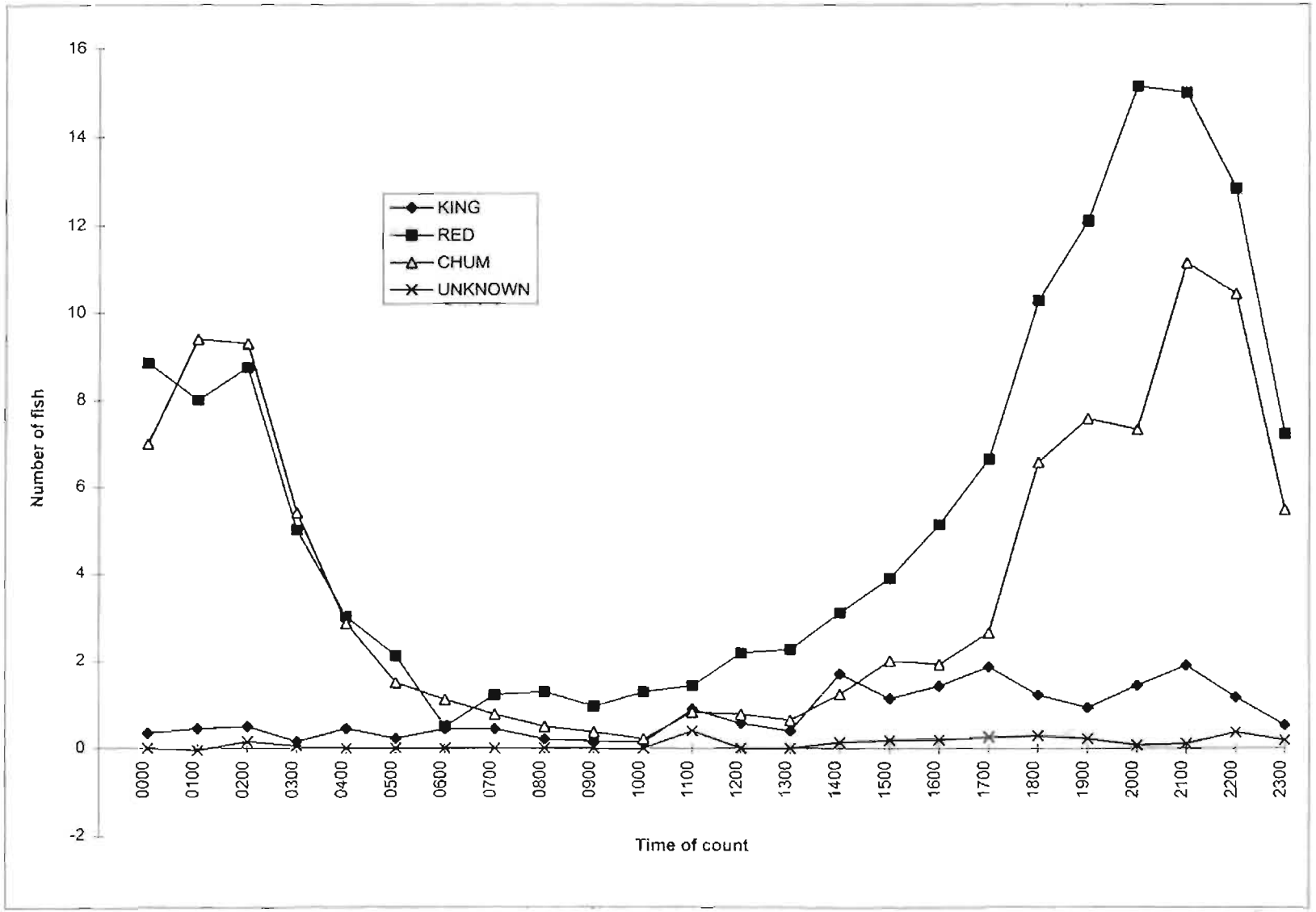


Figure 10. Average actual count (unexpanded) by hour of day for counts from 16 to 31 July.

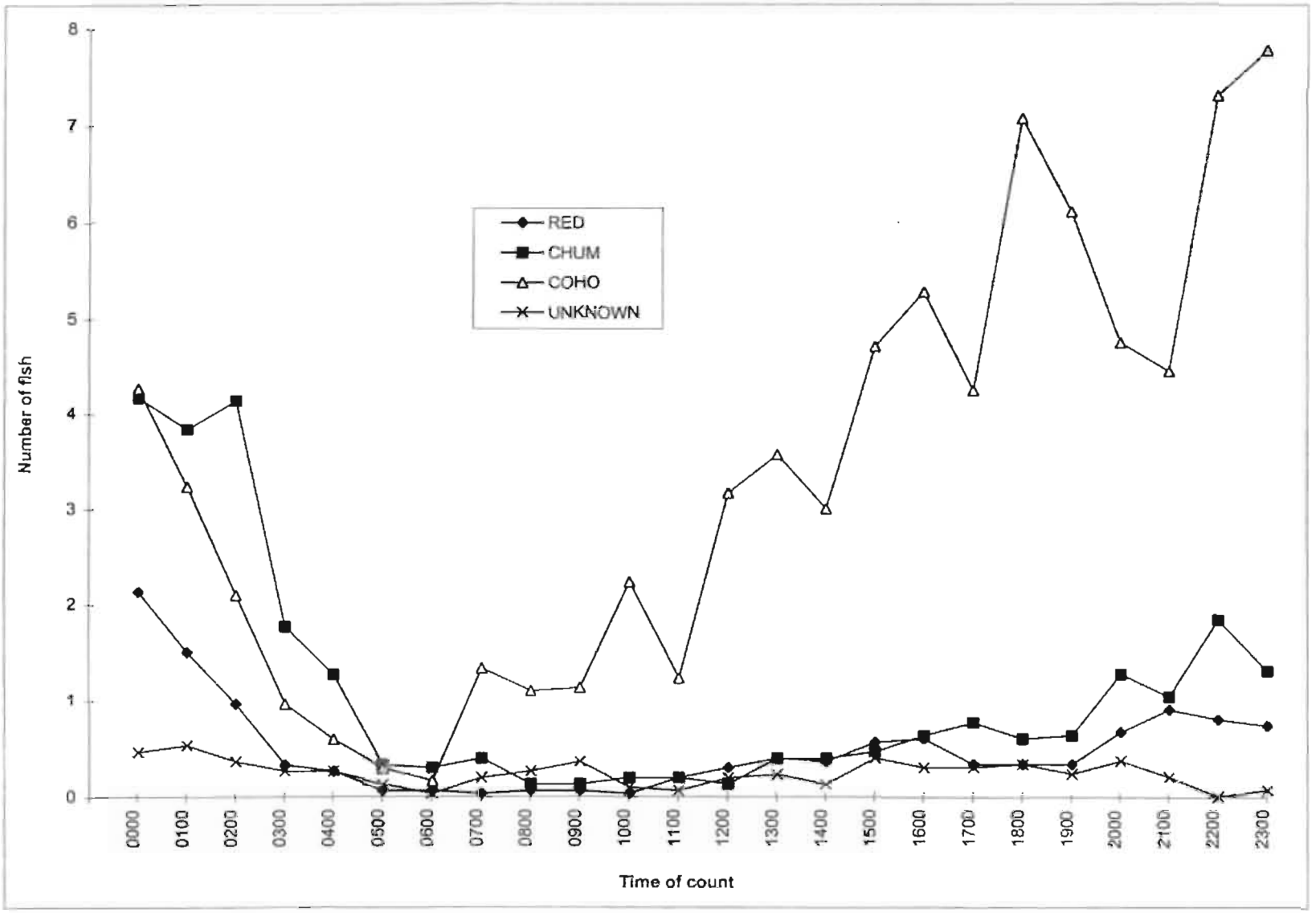


Figure 11. Average actual count (unexpanded) by hour of day for counts from 1 to 15 August.

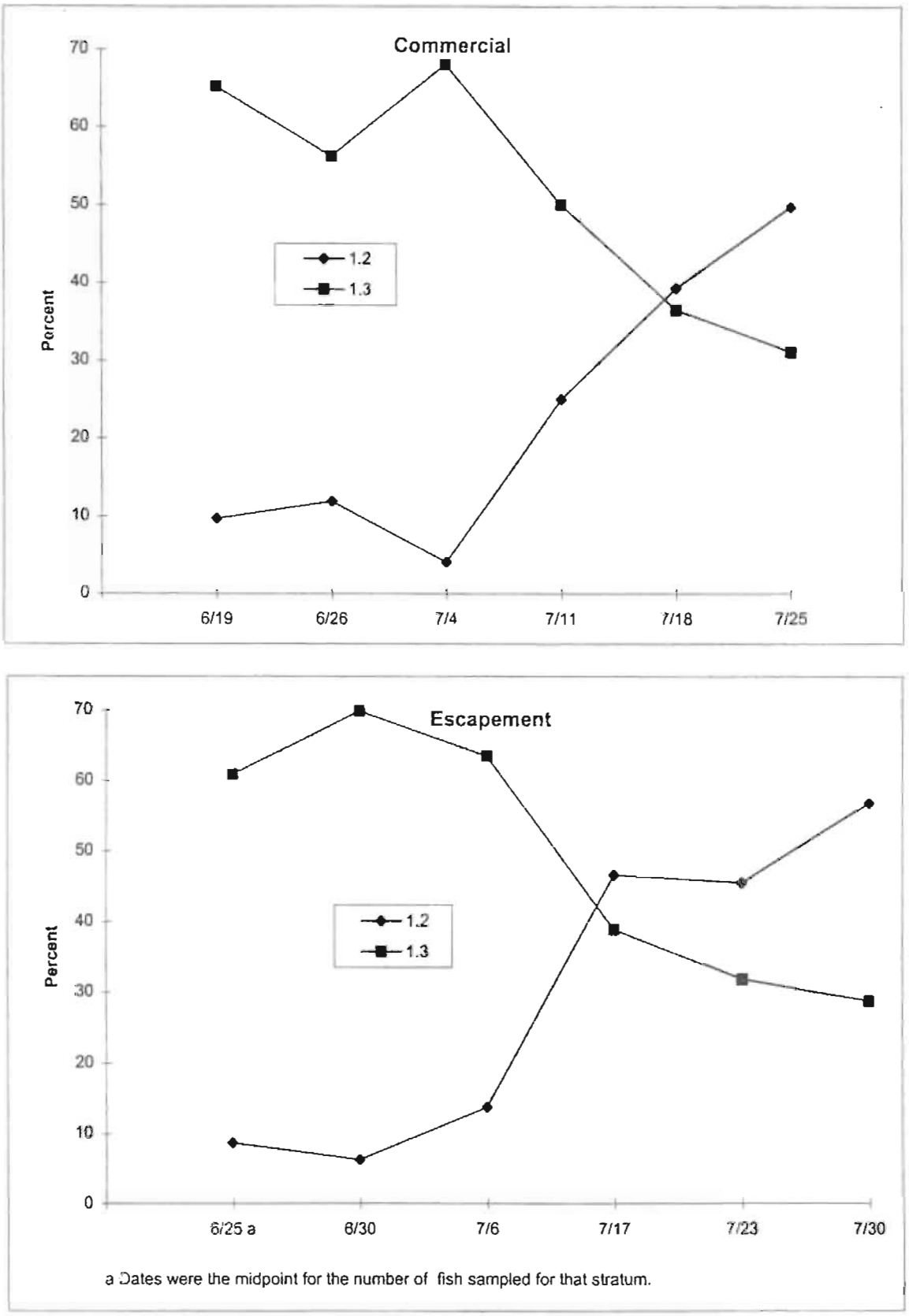
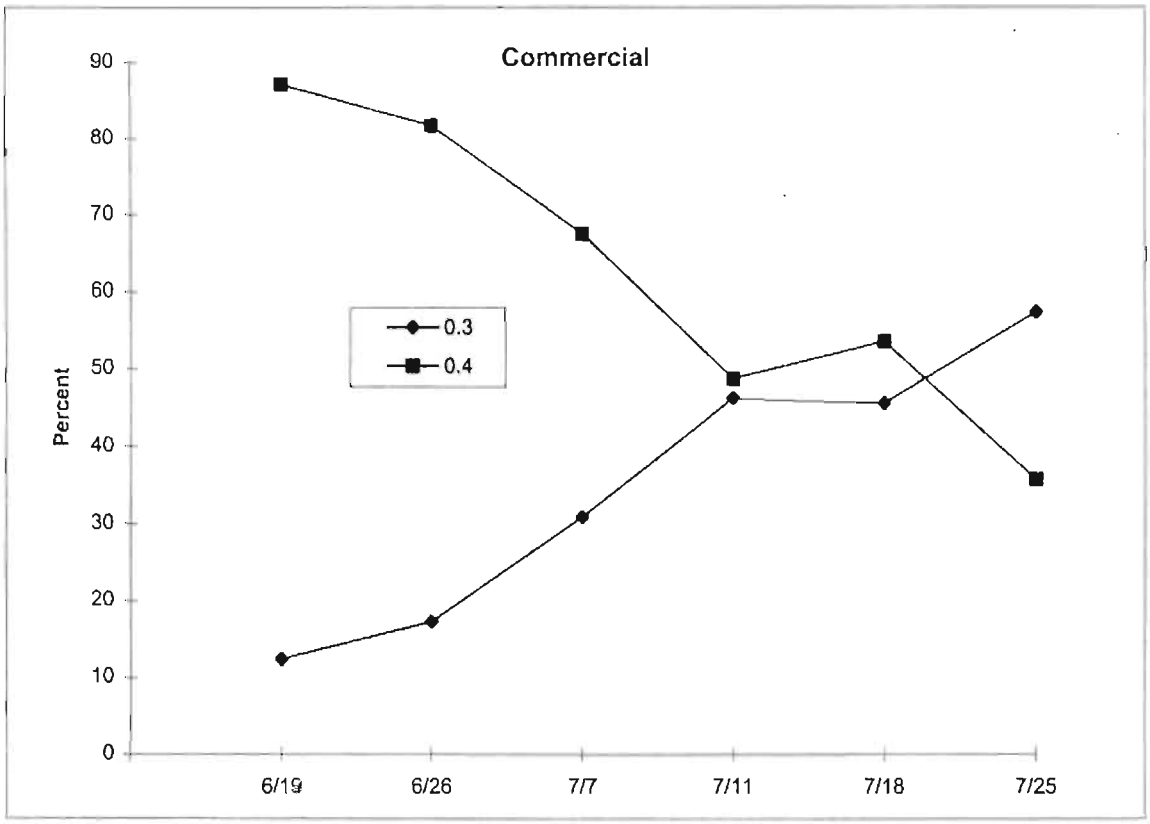
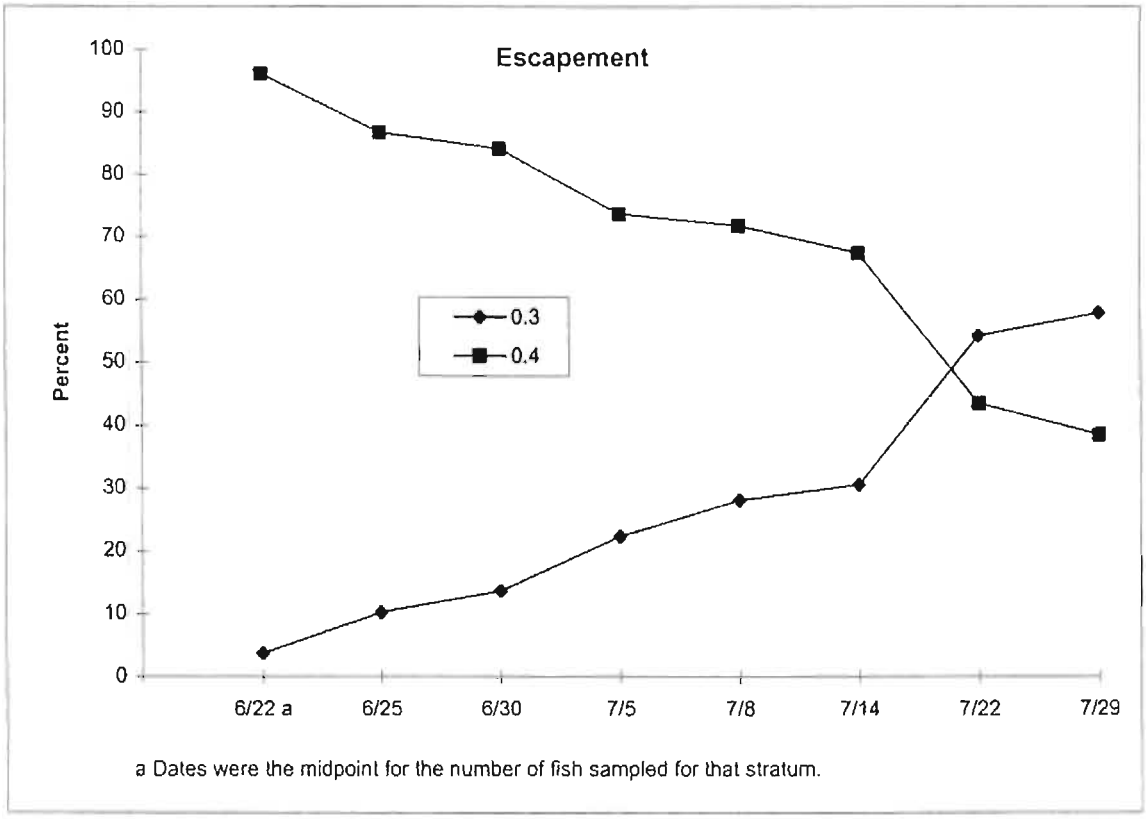


Figure 12. Distribution of age-1.2 and age-1.3 sockeye salmon by sampling date.





a Dates were the midpoint for the number of fish sampled for that stratum.

Figure 13. Distribution of age-0.3 and age-0.4 chum salmon by sampling date.

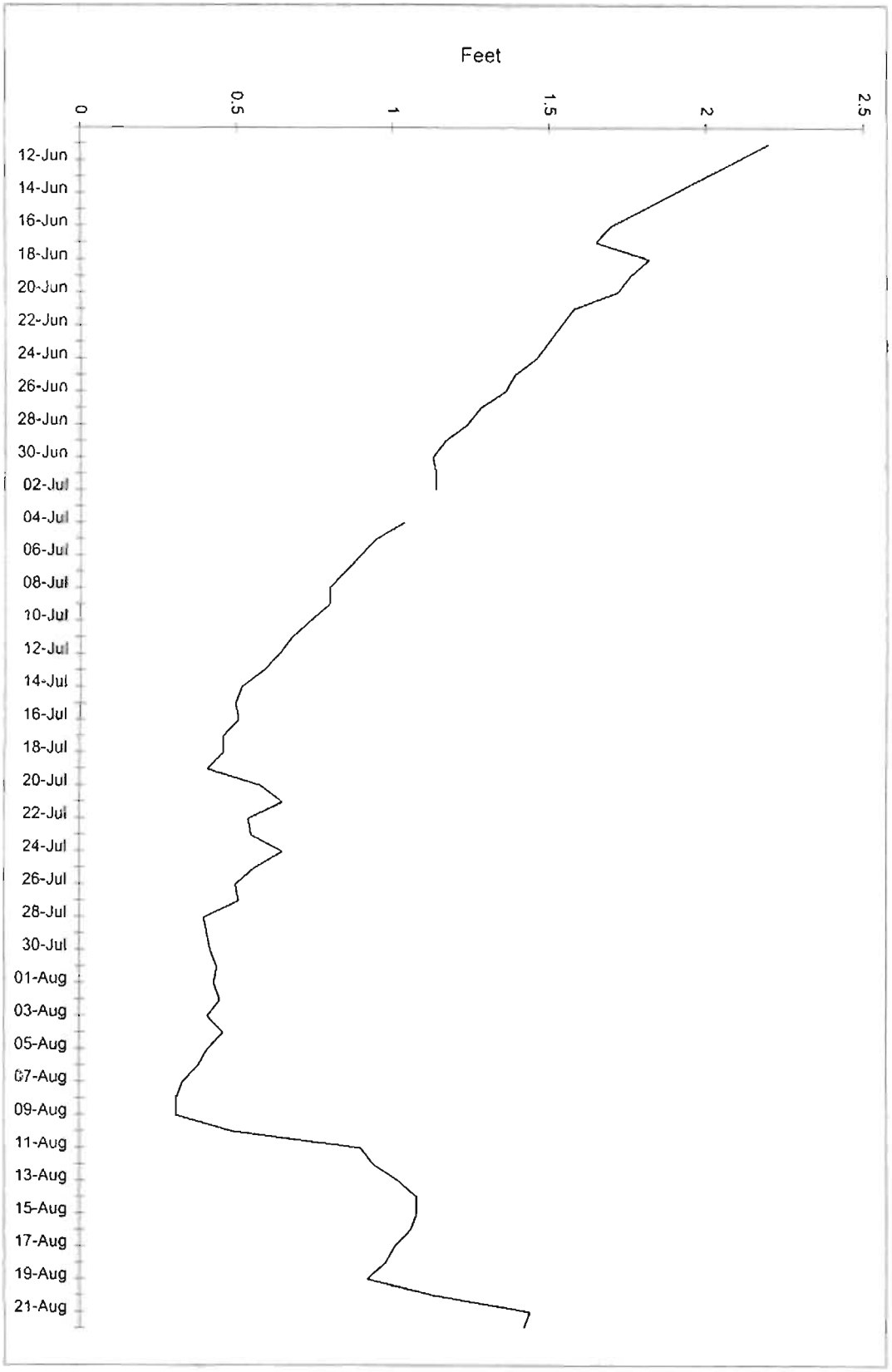


Figure 14. Daily water level (measured at right bank tower site).

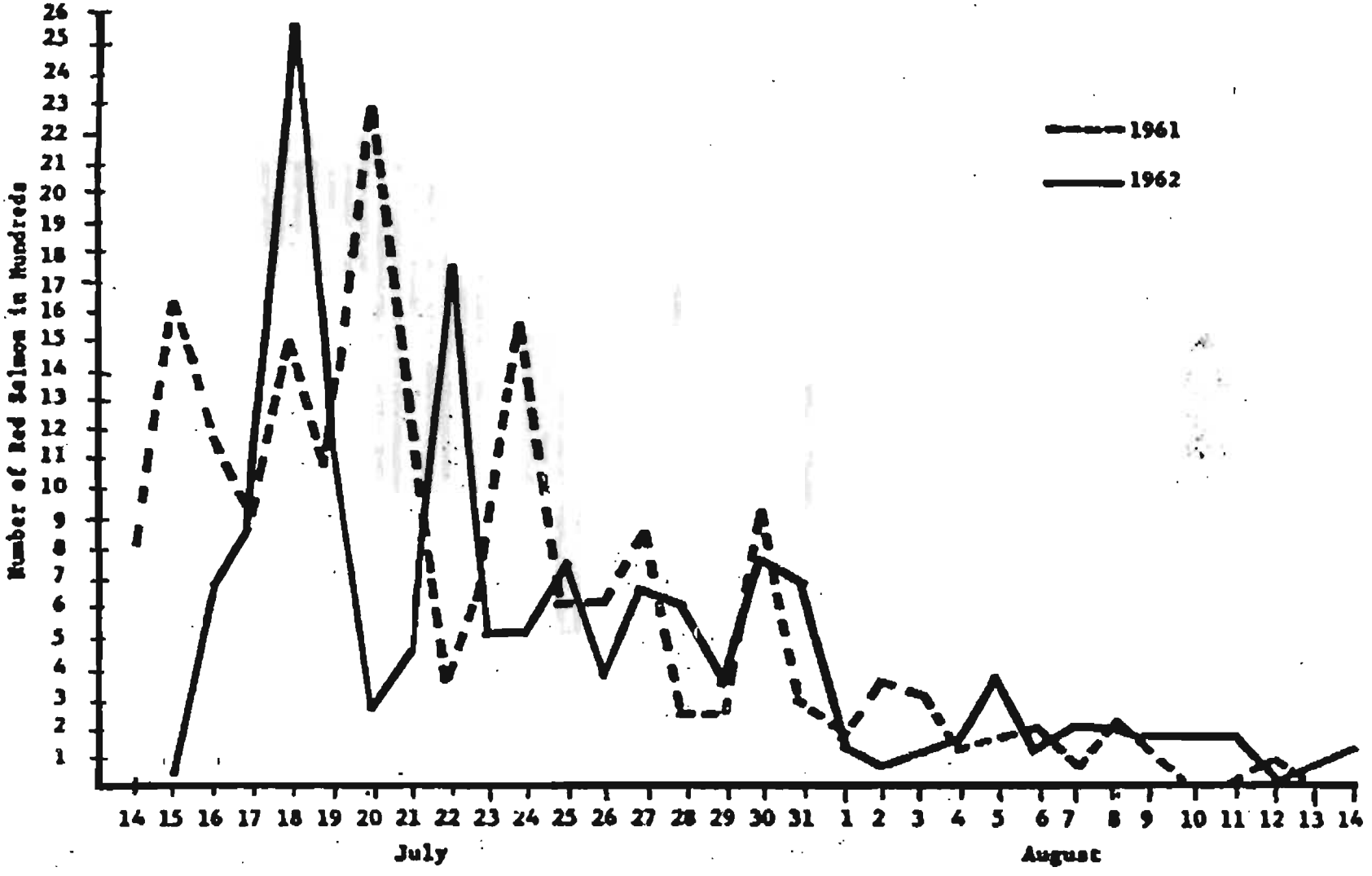


Figure 15. Lake Kagati counting tower red salmon counts, 1961 - 1962.

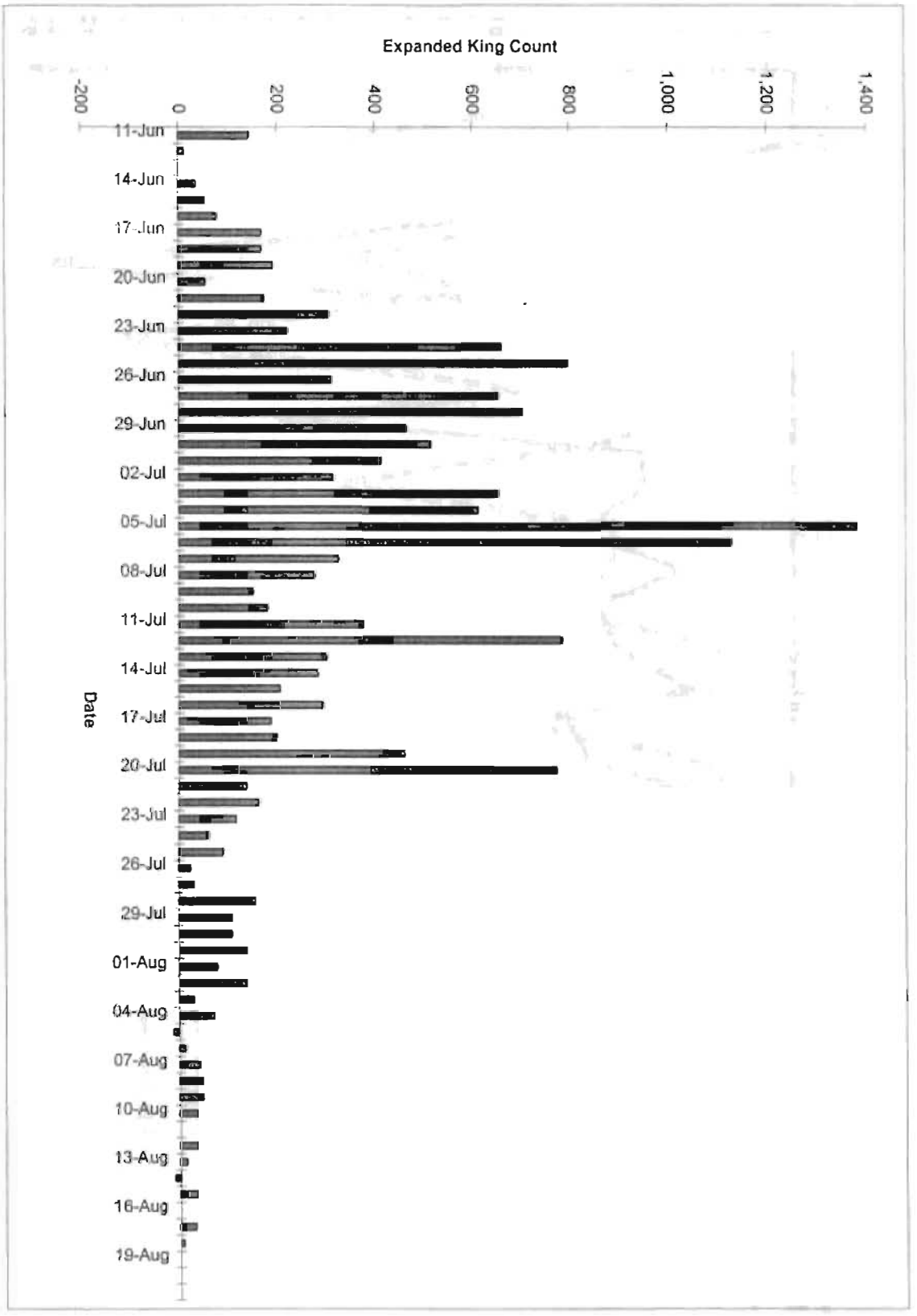


Figure 16. Daily counts (expanded) of king salmon.

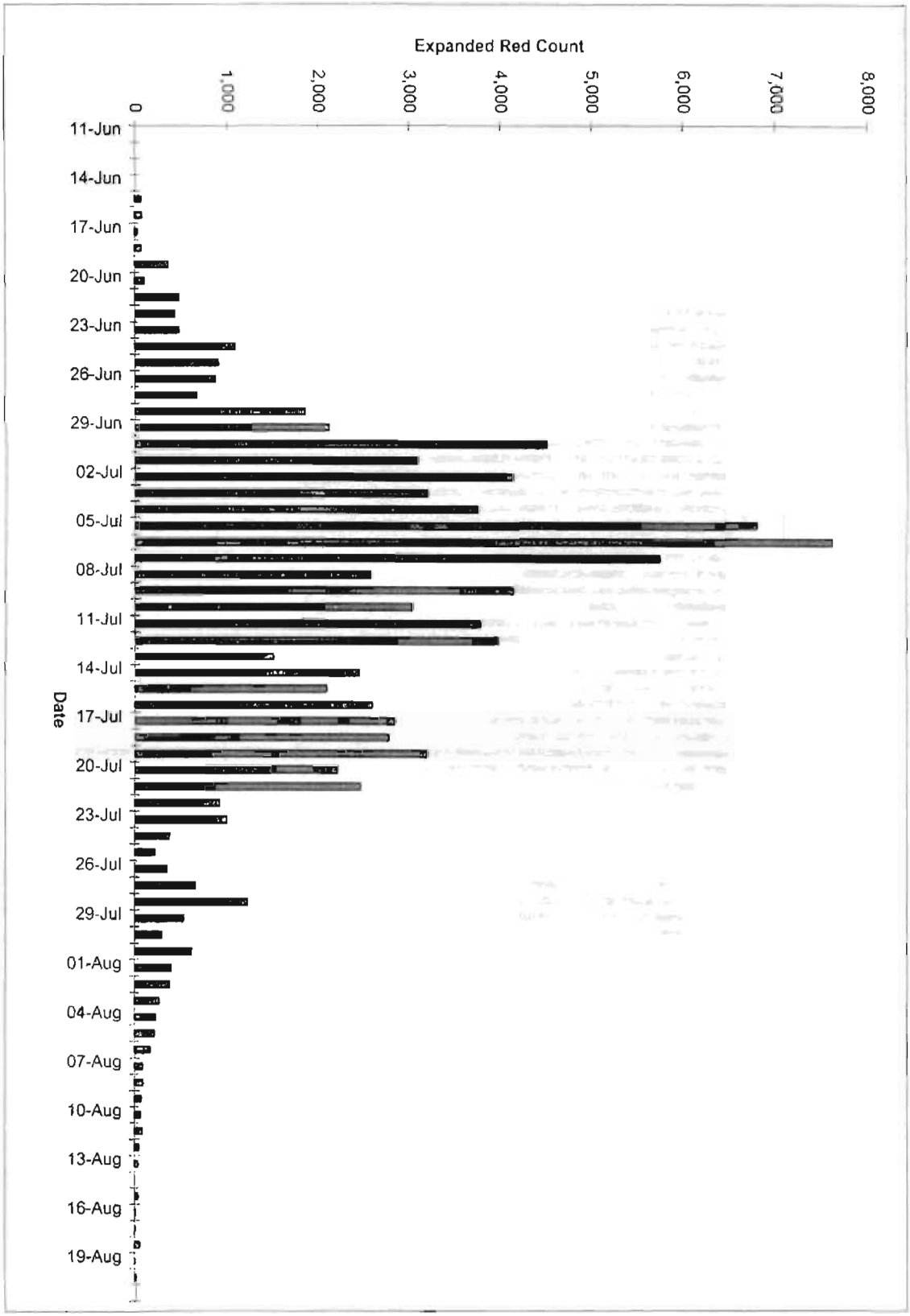


Figure 17. Daily counts (expanded) of red salmon.

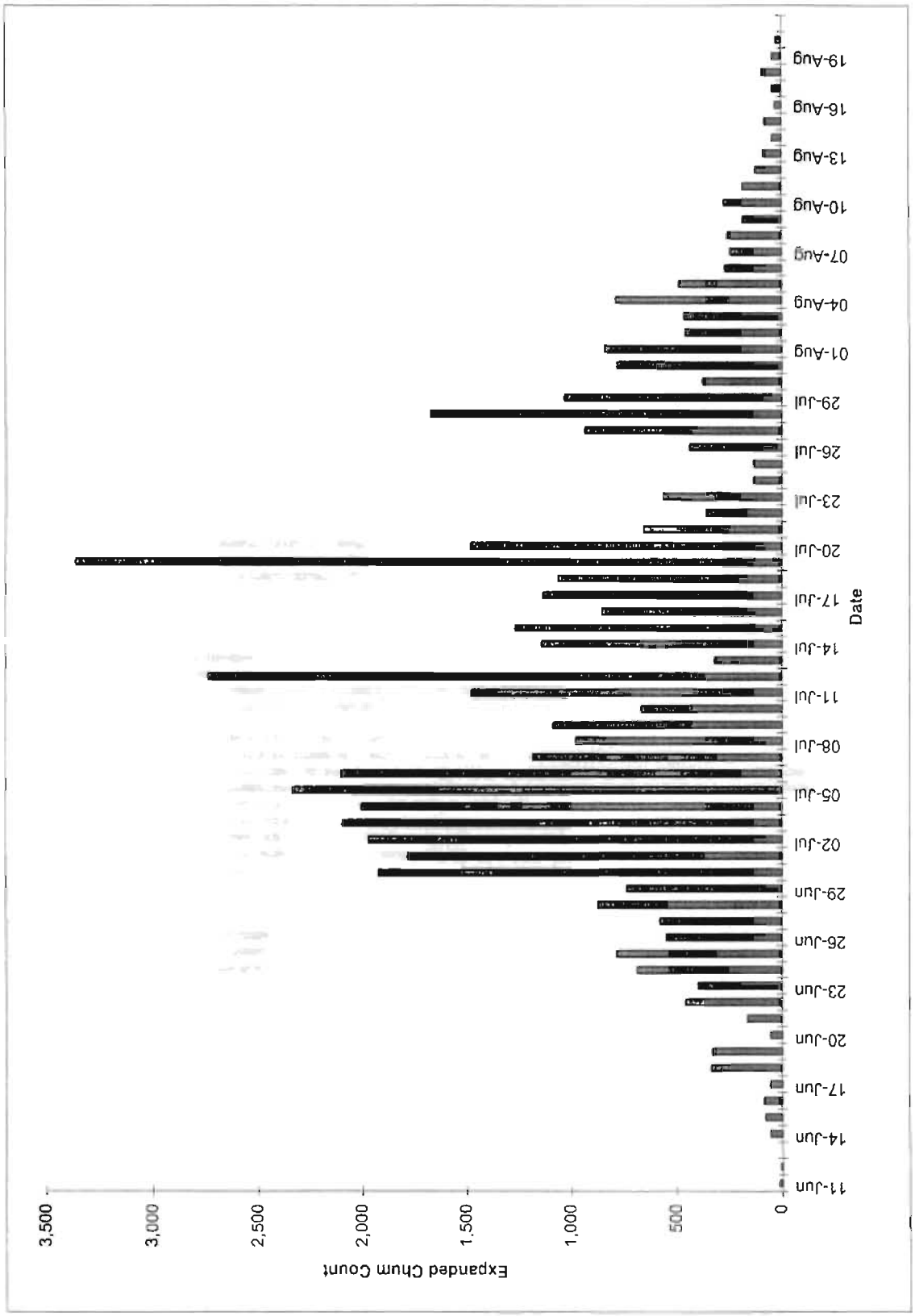


Figure 18. Daily counts (expanded) of chum salmon.

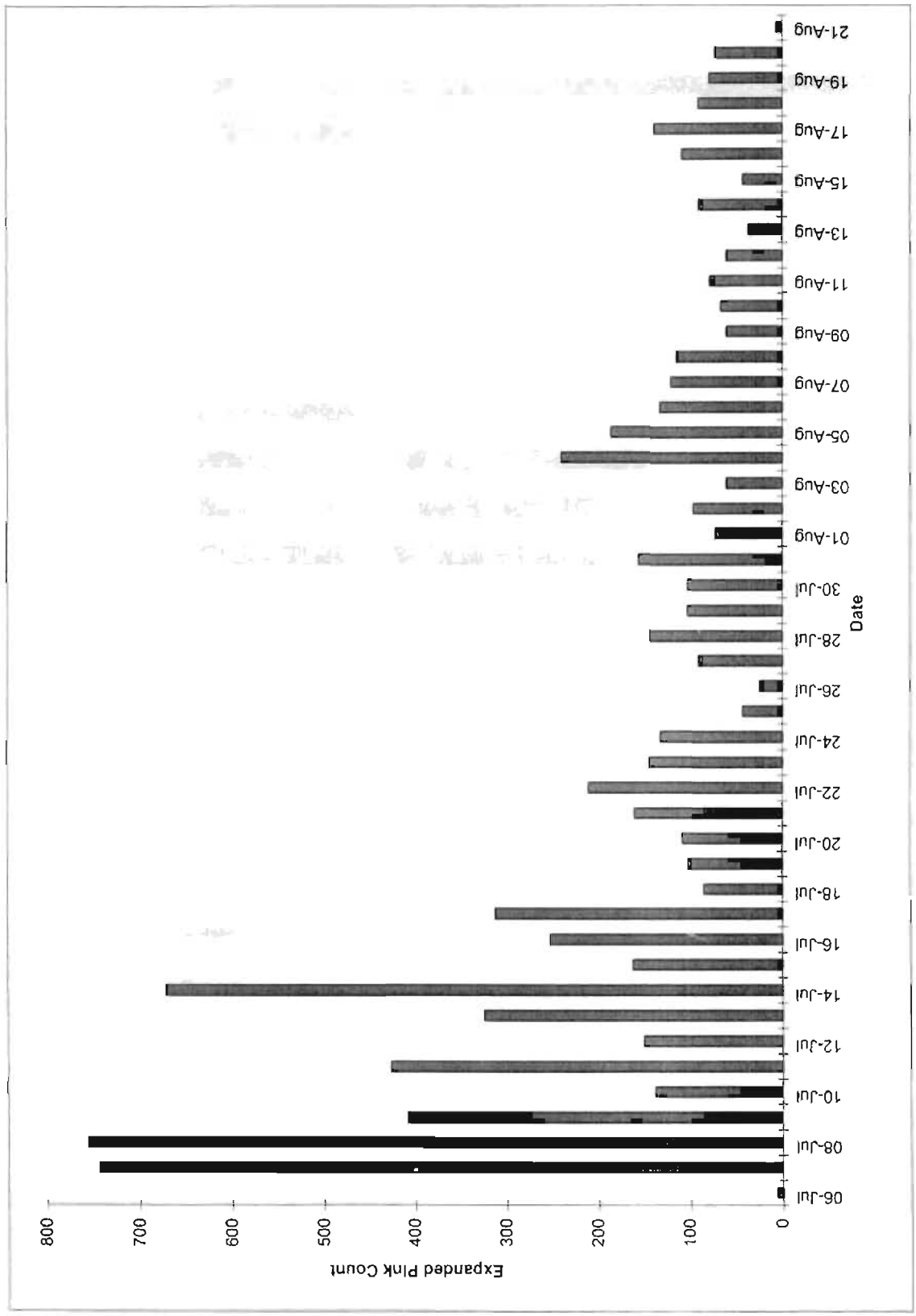


Figure 19. Daily counts (expanded) of pink salmon.

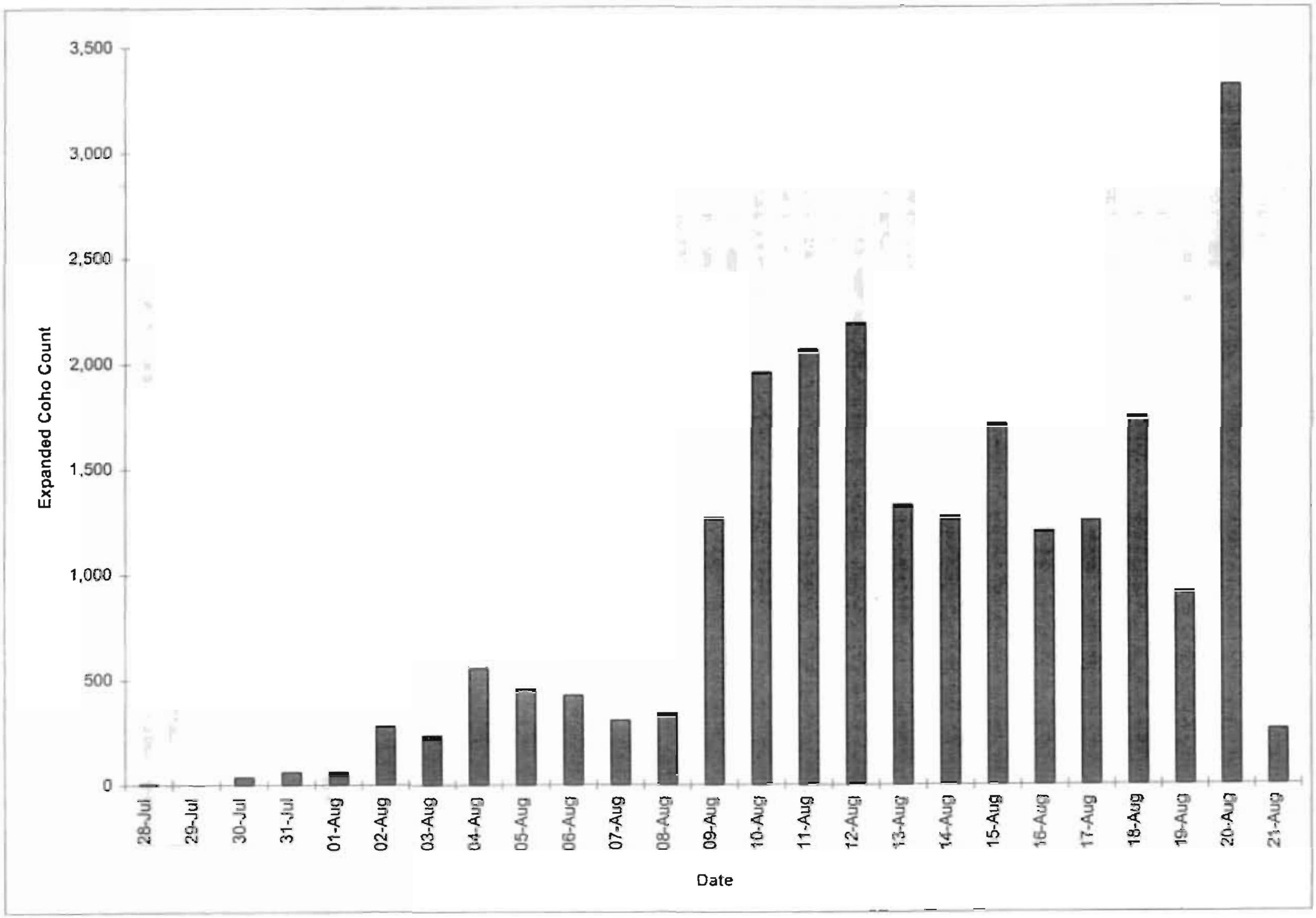


Figure 20. Daily counts (expanded) of coho salmon.

APPENDIX

Appendix A.1. Unexpanded counts of chinook salmon from left bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		1	0	0	2	0	3	3	0	1	2	6	3	5	7							3
0100	1	1		0	0	0	0	0	1	1	1	3	1	4	6	7	6							5
0200	4	0		0	0	1	1	0	5	-1	-1	2	1	1	0	1	0							1
0300	0	0		1	0	1	4	0	4	0	2	4	2	1	3	-1	1							0
0400	0	0		0	*0*	2	1	0	0	0	-1	1	0	7	0	2	0							0
0500	0	0		0	*0*	1	2	0	1	0	1	0	1	4	4	1	5							5
0600	1	-1		0	1	-1	1	0	-4	0	0	2	1	2	1	0	0							6
0700	0	-1		0	0	0	0	0	-1	-1	0	0	0	1	1	-1	0							6
0800	0	0		0	0	0	0	-1	1	0	0	2	1	3	1	0	0							6
0900	0	1		0	0	0	0	0	0	0	1	0	0	2	2	0	0							2
1000	1	0		0	0	0	0	0	0	0	0	2	4	10	8	0	-1							2
1100	0	0		1	1	0	1	0	0	0	0	2	0	5	4	0	3							3
1200	0			0	0	0	0	1	0	-1	2	1	0	6	3	0								5
1300	0			0	0	1	0	0	0	0	3	0	0	8	3	2								3
1400	1			0	0	0	1	0	0	0	*2*	1	2	3	6	3							2	2
1500	0			2	0	0	0	2	*1*	1	1	1	3	8	8	2							1	4
1600	1			0	1	0	0	*1*	*1*	0	3	1	1	9	16	2							0	4
1700	0			0	0	4	1	*1*	*1*	0	0	1	1	6	12	1							2	2
1800	0				0	1	0	*1*	0	0	0	5	1	4	2	4							0	2
1900	-1				0	4	0	*1*	0	1	1	3	5	1	2	1							1	2
2000	3				0	0	0	*1*	1	0	-1	3	1	1	4	2							0	7
2100	0				1	0	2	9	7	3	1	1	1	0	15	5							3	6
2200	0				2	0	1	6	5	2	4	3	1	0	4	5							1	6
2300	2				0	0	0	3	4	1	3	4	1	5	0	0							1	0
	13	0	0	5	6	14	17	25 [a]	*30*	9	*22*	43	30	97	108	41	21	0	0	0	0	0	11	82

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.1. (page 2 of 3).

Time	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	2	6	3	1	2	0	2	0	0	3	0	0	0	-1	0							0	0	0
0100	1	6	1	0	2	0	1	2	2	1	2	0	0	0	0							0	1	1
0200	0	6	1	0	0	0	3	0	2	3	1	1	0	2	0							0	2	1
0300	6	3	1	1	0	0	1	2	4	0	0	0	1	0	0							0	0	1
0400	7	8	3	0	1	0	0	1	1	0	1	1	0	0	0							3	0	0
0500	13	6	3	0	3	0	0	7	3	3	0	0	0	1	1							0		0
0600	5	2	3	0	0	-1	1	3	0	1	3	0	0	1	2							0		2
0700	6	8	2	1	1	1	0	2	0	-1	2	1	0	1	1							0		1
0800	1	2	1	1	0	1	0	1	0	0	0	*1*	*1*	0			0	1	0	0	0	0	1	0
0900	2	3	1	1	1	0	0	0	1	0	1	*1*	*1*	2			0	0	0	0	0	0	0	0
1000	5	3	4	2	0	1	*1*	3	1	0	0	1	0	0			0	0	1	0	0	0	0	1
1100	10	3	1	1	0	2	*1*	0	2	3	1	2	*1*	2		14	0	0	1	1	0	0	0	0
1200	8	9	3	0	0	0	*1*	10	2	1	0	1	4	1			0	2	0	0	0	1	0	3
1300	16	11	2	2	1	1	3	5	1	0	0	1	0	0			0	3	-1	0	1	0	0	0
1400	1	4	2	3	1	0	*4*	0	4	1	0	0	0	3		30	2	3	3	0	0	0	0	0
1500	10	6	2	2	2	0	*4*	3	0	5	0	2	0	2		15	4	2	0	1	0	0		1
1600	2	7	0	1	2	1	2	19	2	0	1	*1*	2	2	2	10	2	2	1	0	2			1
1700	8	1	3	4	0	0	5	4	6	1	3	1	0	4	4	15	2	2	1	1	2			2
1800	27	2	0	1	0	4	5	6	1	2	2	2	2	0	3	8	0	3	2	1	1			0
1900	1	7	0	6	1	2	2	4	5	0	1	8	0	5	0	2	2	-1	0	1	0			0
2000	2	17	2	2	0	0	5	5	1	4	7	3	2	0	7	7	2	0	0	1	1			4
2100	10	5	1	5	0	2	2	8	0	4	1	7	2	0	25	4	2	2	0	2	0			1
2200	4	7	1	0	0	4	2	6	0	4	1	1	6	1	13	0	2	0	1	1	1		0	1
2300	5	4	0	6	0	5	3	3	0	3	1	-1	0	3	5	1	0	1	0	0	0	0	0	0
	152	*136* [a]	40	40	17	23	*48*	94	38	35	28	*34*	*22*	29	63	106	*18*	20	9	9	8	4	4	20

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.1. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	1	1	1	2	2	0	0	-1	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0
0100	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	2	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	1	-1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
0400	1	1	0	0	1	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	1	1	1	1	1	-1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
0600	0	0	0	0	4	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	1	0	0	0
0700	1	0	1	1	0	0	0	0	-1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	*0*
0800	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	1	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1100	0	0	0	0	0	0	-1	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	1	1	0	0	1	0	0	1	-1	1	0	0	1	0	1	0	0	0	0	1	0	0	0	
1300	0	0	0	1	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
1400	1	2	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	
1500	1	0	1	1	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1600	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1700	2	1	-1	0	2	0	-1	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	
1800	4	1	0	0	0	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	
1900	2	1	1	0	1	1	0	0	1	0	0	0	0	0	1	0	-1	0	0	0	0	0	0	
2000	0	0	0	3	0	-2	0	-1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	
2100	0	1	0	0	2	0	1	0	1	1	0	0	0	0	0	0	-1	0	0	1	0	0	0	
2200	0	0	2	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
2300	0	0	1	3	0	-1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
	15	13	12	12	17	0	8	-4	2	4	6	4	2	0	5	0	-2	4	0	5	1	0	0	*0* [a]

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.2. Unexpanded counts of chinook salmon from right bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		0	0	0	1	0	0	0	0	1	0	0	1	1	3	13	14	1	6	7	4	1
0100	2	1		0	0	0	0	0	0	1	0	0	1	0	1	2	1	9	6	3	5	2	3	0
0200	1	0		0	1	0	1	0	0	0	0	1	1	0	0	0	2	8	5	2	2	1	5	1
0300	0	0		0	0	0	2	0	0	1	1	0	0	0	2	0	0	6	11	0	1	1	1	0
0400	0	0		0	*0*	0	1	2	0	0	2	1	0	1	0	0	0	3	4	1	0	3	0	0
0500	0	1		0	*0*	0	0	0	0	0	-1	0	0	0	0	0	0	14	4	4	0	3	4	2
0600	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	2	4	2	0
0700	0	0		0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	3	6	1	1	6	1
0800	0	0		0	2	0	0	0	-1	0	0	0	0	0	0	0	0	0	1	3	6	3	4	3
0900	0	0		0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	3	4	5	4	1	1
1000	0	0		1	0	0	0	0	0	0	0	0	0	0	0	0	-2	3	0	5	10	7	9	0
1100	0	0		0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	1	6	9	4	6	1
1200	1			0	0	0	0	0	0	0	0	0	0	0	0	1	6	11	5	14	4	2	5	1
1300	0			0	0	-1	0	0	0	0	0	0	0	1	2	0	3	7	11	12	5	6	16	0
1400	2			0	0	0	0	0	0	0	0	0	0	1	3	1	0	28	13	18	7	5	17	0
1500	0			0	0	0	0	0	0	0	0	0	1	1	3	1	11	15	9	17	9	7	6	0
1600	0			0	0	0	0	*0*	0	0	0	0	1	2	4	1	11	18	10	19	15	9	12	3
1700	0			0	0	0	0	*0*	0	0	0	0	1	0	3	1	11	13	16	7	4	7	1	2
1800	0				0	0	4	*0*	0	0	0	0	1	0	0	0	15	6	4	11	8	0	2	1
1900	0				0	0	0	*0*	0	0	1	0	0	0	0	0	30	24	17	15	7	4	3	0
2000	3				0	0	1	*0*	1	0	0	2	0	0	0	0	23	28	10	10	9	4	3	1
2100	0				0	0	0	0	1	-1	0	1	0	2	2	1	30	7	5	-2	17	13	5	1
2200	2				0	0	0	1	1	0	1	1	0	0	0	0	15	13	1	6	4	1	13	0
2300	0				0	0	1	0	0	-1	3	1	0	4	0	2	13	2	1	5	2	7	3	1
	11	2	0	1	*3* [a]	-1	11	*3*	*2*	0	*7*	8	7	13	25	11	*172*	235	155	172	138	105	131	20

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.2. (page 2 of 3).

Time	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	0	2	3	0	3	0	2	2	0	1	1	0	0	2	0							0	0	1
0100	0	*1*	0	0	1	0	0	1	1	0	0	0	0	0	1							0	1	1
0200	2	*1*	0	0	0	0	-1	1	0	0	0	0	0	0	0							0	0	1
0300	2	1	1	0	0	0	1	0	0	1	0	1	0	0	0							0	0	0
0400	2	0	0	0	1	0	2	0	0	1	2	0	1	0	0							0	0	1
0500	6	0	0	1	0	0	1	3	0	0	0	1	0	0	0							0	*0*	0
0600	5	2	0	1	0	0	0	1	0	0	0	0	0	1	2							0	*0*	0
0700	2	3	1	0	0	0	1	0	0	1	0	0	1	0	0							0	*0*	0
0800	1	1	0	0	0	0	0	0	0	0	0	*0*	*0*	0			0	0	2	0	0	0	0	0
0900	1	1	0	0	0	0	0	0	2	0	0	*0*	*0*	0			0	0	1	0	0	0	0	0
1000	1	0	0	0	0	0	*0*	0	1	0	0	0	0	0			0	0	0	0	0	0	0	0
1100	2	1	2	0	1	0	*0*	0	0	0	0	1	*0*	0		2	0	0	0	0	1	0	0	0
1200	1	4	1	0	0	1	*0*	2	1	0	0	0	0	0			0	1	0	0	0	0	0	0
1300	4	2	2	1	0	0	0	0	2	0	0	1	0	0			0	0	3	0	1	0	0	0
1400	0	2	2	0	1	1	2	1	1	0	0	3	0	0		3	1	0	0	0	0	0	0	0
1500	4	20	0	1	1	1	2	4	0	0	1	2	1	0		0	0	0	0	0	0	0		0
1600	3	1	1	2	0	0	2	13	0	3	0	2	1	0	0	3	*0*	1	2	0	2			0
1700	9	2	0	0	0	1	1	2	0	1	1	0	1	0	2	9	0	1	0	0	3			0
1800	25	2	1	0	0	2	2	2	1	2	-1	2	0	0	2	1	0	1	0	0	0			1
1900	6	4	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	0	0	0			1
2000	0	0	0	0	0	1	0	2	1	0	0	0	1	0	5	2	1	1	1	0	0			0
2100	1	1	0	0	0	0	0	2	1	1	1	0	1	1	1	2	1	0	0	1	0			0
2200	0	1	0	0	0	0	0	0	0	0	1	2	0	0	1	1	1	0	1	0	0		0	0
2300	1	0	0	0	0	0	0	0	0	0	-1	0	2	0	0	0	0	1	0	0	0	0	0	0
	78	*52* [a]	14	6	8	7	*15*	37	12	12	6	*15*	9	4	14	23	5	7	10	1	7	0	*1*	6

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.2. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
0200	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
0400	0	1	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	1	0	0	0	0	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	-1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
1200	0	1	0	0	0	0	-2	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1300	0	1	1	0	0	-1	-2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1400	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1500	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
1600	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	
1700	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	-1	0	0	0	0	
1800	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
1900	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	
2000	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2100	0	0	0	0	0	-1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
2200	0	-1	1	0	0	-1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2300	0	0	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3	5	11	1	6	5	4	2	0	3	2	4	4	0	1	2	0	2	0	0	0	0	0	*0* [a]

[a] Counts in italics indicate an Intrerpolation occurred for one or more missing counts.

Appendix A.3. Unexpanded counts of sockeye salmon from left bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		0	0	0	0	0	4	3	4	5	6	8	12	6	8							12
0100	0	0		0	0	1	0	0	0	0	3	6	7	3	10	9	2							11
0200	0	0		0	0	0	0	0	2	0	-3	-1	2	2	8	1	0							17
0300	0	0		0	0	2	0	0	4	1	5	8	2	2	9	1	1							4
0400	0	0		0	0	3	1	1	3	0	1	7	0	0	1	3	1							3
0500	0	0		0	0	0	1	0	0	0	1	-1	0	0	3	0	0							3
0600	0	0		0	0	5	0	1	0	0	0	1	0	0	3	0	2							4
0700	0	0		0	0	0	0	0	0	0	0	2	0	0	1	2	0							11
0800	0	0		0	0	0	0	0	0	0	0	1	0	2	0	0	0							7
0900	0	0		0	0	0	0	0	0	0	0	0	0	0	1	0	0							7
1000	0	0		0	0	0	0	0	0	0	0	0	1	4	0	1	0							2
1100	0	0		0	0	0	0	0	0	-1	1	0	2	6	0	1	0							2
1200	0			0	0	0	2	0	0	1	0	2	1	4	1	2								2
1300	0			0	0	0	0	0	1	0	0	4	2	2	3	5								4
1400	0			0	0	0	0	0	1	2	0	0	1	3	0	18							2	6
1500	0			0	0	0	0	5	3	1	0	3	2	11	0	6							6	11
1600	0			0	0	0	0	1	3	0	0	0	0	6	11	4							2	5
1700	0			0	0	2	1	1	3	0	0	0	2	7	9	3							1	3
1800	0				0	0	0	1	1	0	2	1	8	7	5	4							1	9
1900	0				1	0	0	1	0	0	0	2	6	3	1	3							3	4
2000	0				3	0	0	1	4	0	8	4	0	23	6	10							1	14
2100	0				0	0	0	0	7	3	6	2	0	7	7	14							3	10
2200	0				0	0	0	0	16	0	0	2	0	4	15	7							5	20
2300	0				5	0	0	0	1	2	7	3	1	9	0	2							38	11
	0	0	0	0	9 [a]	13	5	12	53	12	35	51	43	113	106	102	14	0	0	0	0	0	62	182

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.3. (page 2 of 3).

Time	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	6	3	7	0	4	4	4	1	0	4	8	9	4	2	-1							2	11	-1
0100	31	*8*	12	0	2	1	3	3	25	11	10	7	5	14	2							1	6	16
0200	20	*8*	12	4	1	-1	26	25	17	15	5	15	7	13	6							5	10	14
0300	26	8	11	7	3	1	7	7	3	11	6	8	4	9	2							5	3	6
0400	15	12	4	2	0	3	1	0	1	-1	4	4	1	6	3							3	-2	4
0500	6	2	2	3	1	0	-1	1	1	1	3	-1	3	1	4							3	*4*	0
0600	1	0	4	4	3	1	2	-1	3	0	1	4	-1	-3	1							1	*4*	0
0700	10	4	4	3	2	2	1	0	1	0	1	2	2	1	4							0	*4*	0
0800	1	0	1	2	1	0	0	0	1	0	2	*3*	*4*	9			4	0	3	0	1	0	0	0
0900	0	2	1	0	2	1	0	0	0	7	4	*3*	*4*	-1			5	2	4	0	1	0	0	0
1000	3	1	6	4	1	0	2	0	0	0	0	5	1	3			9	2	0	0	0	0	0	1
1100	3	2	8	3	0	4	2	4	1	0	1	6	*4*	1		0	3	1	2	0	1	0	0	0
1200	3	4	4	4	4	3	2	3	0	2	1	1	0	11			7	6	4	2	0	2	0	1
1300	4	0	2	4	11	3	2	16	3	4	0	5	6	6			11	0	0	1	1	1	3	0
1400	5	8	3	2	1	3	7	3	4	2	11	5	5	28		14	6	-2	2	0	1	1	2	5
1500	1	5	4	1	5	44	7	1	6	14	3	18	3	6		18	12	4	4	0	0	0		1
1600	5	7	13	2	12	7	9	26	14	21	16	*12*	12	13	26	27	*17*	1	5	2	0			14
1700	14	8	32	4	5	6	15	6	8	16	10	9	4	11	23	13	20	10	10	2	1			5
1800	24	2	1	3	6	15	12	9	4	8	8	14	13	5	45	28	28	9	2	5	6			11
1900	4	1	2	2	5	10	15	13	18	-2	12	19	73	49	21	11	4	6	8	1	2			3
2000	2	4	13	5	20	21	-1	28	16	3	38	16	25	16	96	26	14	4	4	5	3			5
2100	27	4	2	4	14	53	29	10	2	17	22	18	14	19	62	19	4	18	7	13	4			4
2200	6	0	5	7	12	37	18	54	1	24	23	16	44	23	53	41	4	2	4	12	1		14	6
2300	4	4	12	6	29	29	5	4	1	18	9	2	8	8	0	14	8	7	7	8	1	14	4	2
	221	*97* [a]	165	76	144	247	*167*	213	130	175	198	*200*	*245*	250	347	211	*156*	70	66	51	23	38	*63*	97

Appendix A.3. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	5	8	6	4	9	5	4	1	0	2	2	0	0	0	1	3	0	0	0	0	0	0	0	0
0100	5	2	8	3	1	3	6	3	1	0	-1	1	0	1	0	1	0	0	0	0	0	0	0	0
0200	9	4	3	5	1	-1	2	2	2	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0
0300	2	4	2	1	0	1	0	2	0	0	0	0	1	0	0	-1	0	-1	0	0	0	0	0	0
0400	2	1	2	1	1	2	0	0	0	0	-1	0	0	1	0	0	1	0	0	0	0	0	0	0
0500	1	1	4	1	0	0	0	0	1	0	0	2	0	0	0	0	-1	0	0	0	0	0	0	0
0600	0	0	1	0	1	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	-1	0	0	0	0
0700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	*0*
0800	0	0	0	0	0	-1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0900	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0
1000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
1200	1	0	0	2	0	1	0	0	0	0	0	2	0	1	0	1	0	0	0	0	1	0	0	
1300	1	1	0	2	2	3	1	-1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	
1400	2	0	0	0	0	4	0	0	0	0	0	0	1	2	1	0	0	0	0	0	-1	0	0	
1500	3	1	1	2	0	1	0	0	1	0	0	1	2	3	1	0	0	0	0	0	-1	0	0	
1600	0	0	1	0	4	2	1	4	2	0	0	0	1	0	0	0	0	1	0	0	1	0	-1	
1700	5	0	6	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	
1800	2	1	6	-1	2	1	2	2	2	0	1	0	0	1	0	0	0	1	0	0	1	0	0	
1900	4	2	6	0	4	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	-1	0	1	
2000	2	0	4	4	3	1	1	2	1	1	2	0	0	0	0	0	0	1	0	0	2	0	0	
2100	2	2	3	6	4	2	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
2200	2	1	9	12	2	0	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	1	
2300	1	0	3	1	7	1	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
	51	28	66	44	41	29	24	22	13	7	3	9	7	12	4	5	0	2	1	-1	3	1	1	*0* [a]

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.4. Unexpanded counts of sockeye salmon from right bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		0	0	0	0	0	2	0	7	9	8	8	10	1	8	32	47	43	49	69	26	15
0100	0	0		0	0	0	0	0	0	0	0	1	5	2	5	3	12	22	46	14	28	37	36	20
0200	0	0		0	0	0	0	0	2	0	2	0	6	5	1	4	2	37	32	13	19	44	32	29
0300	0	0		0	0	0	0	0	0	1	2	0	2	4	5	0	3	14	38	25	4	47	49	10
0400	0	0		0	*0*	0	0	0	0	1	5	0	1	2	1	0	1	8	34	8	2	32	29	7
0500	0	0		0	*0*	0	0	0	0	0	3	1	0	0	2	0	0	12	6	7	1	29	7	4
0600	0	0		0	0	0	0	0	0	0	0	1	0	0	1	0	0	42	47	11	3	47	2	1
0700	0	0		0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	10	8	1	60	2	10
0800	0	0		0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4	21	2	74	3	5
0900	0	0		0	0	0	0	0	0	0	2	-1	0	1	4	0	0	1	5	38	13	5	5	3
1000	0	0		0	0	0	0	0	0	0	0	0	0	0	3	0	0	7	3	12	21	3	66	1
1100	0			0	2	0	0	0	0	0	0	0	0	2	0	2	0	5	3	59	6	43	13	5
1200	0			0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	8	137	1	31	12	2
1300	0			0	0	0	0	0	0	0	0	0	0	2	0	0	0	8	36	154	72	89	81	9
1400	0			0	0	0	0	0	0	0	*0*	0	0	3	0	5	0	51	74	134	62	44	7	0
1500	0			0	0	0	0	0	*0*	0	0	0	1	2	1	4	*10*	30	30	121	128	73	5	2
1600	0			0	0	0	0		*0*	0	0	0	1	4	1	0	*10*	33	47	149	34	92	29	122
1700	0			0	0	0	0		*0*	0	0	2	3	9	4	1	*10*	45	41	104	37	118	19	31
1800	0				0	0	0		0	1	0	0	2	3	0	3	28	18	32	190	158	77	19	80
1900	0				1	0	0		*0*	1	0	0	3	2	0	0	29	38	42	86	100	148	30	19
2000	0				0	0	0		1	1	0	3	1	0	2	1	17	41	21	57	105	95	25	17
2100	0				0	0	0	0	0	0	3	0	2	8	1	2	12	22	52	64	93	55	79	41
2200	0				0	0	0	0	1	0	0	2	0	5	1	0	10	57	13	40	48	16	52	4
2300	0				0	0	0	0	2	0	21	2	0	5	3	16	18	88	33	7	42	49	24	6
	0	0	0	0	3 [a]	0	0	0	*8*	5	*45*	21	37	69	46	44	*172*	618	704	1502	1029	1377	653	443

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.4. (page 2 of 3).

	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
Time	36	34	335	27	51	13	19	25	16	29	12	26	1	9	16							4	2	47
0000	22	*61*	40	6	59	11	64	62	33	23	19	14	15	24	5							3	4	15
0100	47	*61*	39	20	32	19	48	31	6	12	13	4	25	20	7							7	10	7
0200	31	23	34	20	46	13	24	18	7	12	11	5	18	14	4							1	6	0
0300	17	31	11	16	39	3	7	1	0	2	2	3	7	9	3							2	2	3
0400	8	11	20	12	31	0	5	3	5	6	3	7	3	6	2							0	*2*	0
0500	9	24	17	41	45	12	3	10	5	11	9	2	1	2	0							0	2	0
0600	39	24	16	23	23	17	18	2	13	13	1	4	3	5	0							0	*2*	0
0700	0	8	1	3	6	3	2	0	0	21	0	*5*	*8*	7			7	0	0	0	0	0	0	0
0800	3	12	4	4	2	3	0	1	0	7	0	*5*	*8*	9			2	0	0	0	0	0	0	0
0900	4	32	19	1	1	1	*5*	0	4	5	0	4	4	0			2	2	1	0	0	0	0	0
1000	7	26	6	8	3	1	*5*	2	1	7	0	9	*8*	9		3	2	0	2	0	0	0	1	0
1100	17	49	11	21	13	17	*5*	0	1	1	0	5	10	1			4	1	3	1	0	0	0	0
1200	9	24	18	20	19	44	5	6	0	1	0	9	1	3			13	1	0	0	1	-1	0	0
1300	3	17	27	23	14	41	*15*	22	3	8	0	5	0	1		6	3	0	3	2	2	1	0	0
1400	8	44	8	1	19	0	*15*	43	3	0	0	0	4	6		5	11	7	2	0	0	0		0
1500	16	23	11	6	2	7	31	35	3	9	4	*9*	6	0	3	4	*13*	1	1	1	1			3
1600	62	107	82	8	16	14	34	8	10	10	1	3	12	1	6	14	21	4	1	1	1			2
1700	146	58	13	15	16	6	45	13	1	21	3	27	10	2	6	5	16	21	9	0	0			15
1800	53	89	12	1	11	14	42	0	1	7	6	16	21	13	14	3	31	4	21	0	0			5
1900	6	43	1	6	38	7	44	14	4	7	15	2	17	20	49	28	61	9	13	0	2			0
2000	81	117	18	5	16	2	3	6	1	4	7	40	22	31	36	33	42	4	11	0	3			5
2100	114	146	21	11	18	1	8	80	3	6	9	27	9	12	20	23	17	9	26	4	0		1	3
2200	173	107	28	55	26	9	16	66	2	11	33	1	15	8	14	33	9	21	9	3	3	3	15	4
2300																								
	911	*1171* [a]	792	353	546	258	*463*	448	122	233	148	*232*	*228*	212	185	157	*254*	84	102	12	13	20	*47*	109

Appendix A.4. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	17	3	7	7	6	1	1	6	5	3	3	0	0	0	1	0	0	0	0	0	0	0	0	0
0100	7	4	3	8	1	5	0	4	5	0	1	1	0	0	0	0	0	1	0	-1	1	0	0	0
0200	5	2	2	2	4	0	3	2	1	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0
0300	1	1	5	0	1	0	0	1	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0
0400	2	0	5	2	1	1	0	0	0	0	-1	0	0	0	0	0	0	0	0	-1	0	-1	0	0
0500	1	0	3	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0
0800	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1200	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1300	-1	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1400	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	
1500	2	1	0	1	0	0	0	0	0	0	1	0	3	1	0	0	0	0	0	0	1	0	0	
1600	0	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1700	1	0	0	0	0	0	1	0	1	0	2	0	0	0	2	0	0	0	0	0	0	0	0	
1800	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	
1900	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1	
2000	0	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
2100	0	0	4	1	4	2	0	0	1	0	1	0	0	0	0	0	1	0	0	1	1	0	0	
2200	0	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
2300	1	2	3	0	2	1	1	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	
	38	21	38	22	22	15	14	14	15	8	12	3	4	2	4	1	0	4	1	2	6	0	2	*0* [a]

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.5. Unexpanded counts of chum salmon from left bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		1	0	0	1	0	4	3	3	0	0	3	2	9	8							18
0100	0	0		1	0	0	0	0	1	0	2	0	0	0	3	3	5							22
0200	0	0		0	0	1	-1	0	1	0	3	0	0	2	0	2	1							23
0300	0	0		0	0	0	2	0	7	1	2	0	0	0	4	0	0							4
0400	1	0		0	*0*	1	3	0	4	0	1	0	0	1	1	3	0							4
0500	0	0		0	*0*	0	0	0	2	0	0	0	0	0	1	0	1							6
0600	0	0		1	0	0	2	0	-1	0	0	0	19	1	1	0	0							1
0700	0	0		0	1	0	0	0	0	0	0	0	0	0	0	1	0							6
0800	0	0		0	0	0	0	0	0	0	0	0	0	4	0	0	0							7
0900	0	0		0	0	0	0	0	-1	0	1	0	4	2	1	0	0							5
1000	0	0		0	4	0	0	1	0	0	0	5	0	3	0	0	0							3
1100	0	0		3	0	0	0	0	0	0	0	0	0	4	0	1	0							2
1200	0			2	0	1	0	0	0	0	0	0	1	2	2	1								8
1300	0			0	0	1	0	0	0	0	1	0	0	2	1	3								10
1400	0			0	0	0	0	0	0	0	2	1	1	2	11	16							1	7
1500	0			1	0	0	0	7	*1*	2	5	5	2	9	17	7							7	14
1600	0			0	0	0	0	*1*	*1*	0	3	18	5	5	13	1							2	2
1700	0			0	0	2	0	*1*	*1*	0	0	12	1	7	12	2							0	1
1800	0				0	1	0	*1*	5	0	0	6	1	2	8	3							1	0
1900	0				0	5	0	*1*	2	0	0	5	6	2	7	0							0	2
2000	0				0	0	0	*1*	3	0	2	8	5	10	7	3							0	5
2100	0				0	0	1	7	3	1	0	1	0	2	5	5							2	5
2200	0				0	0	0	8	1	0	0	4	0	0	3	4							2	9
2300	0				0	0	0	15	0	1	0	3	1	11	1	1							18	9
	1	0	0	9	5[a]	12	8	*43*	*34*	8	*25*	68	46	74	100	65	15	0	0	0	0	0	33	173

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.5. (page 2 of 3).

Time	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	5	4	0	0	0	1	1	1	1	4	3	5	0	2	1							0	10	3
0100	8	3	1	0	0	0	3	0	8	3	1	1	3	5	1							4	16	32
0200	9	3	5	0	0	0	14	16	6	5	4	4	6	5	3							15	10	25
0300	4	0	1	0	0	0	3	0	0	3	2	2	3	2	2							4	4	10
0400	4	0	0	0	0	0	1	1	0	1	0	2	2	1	0							1	3	9
0500	3	6	1	0	0	0	0	1	1	0	4	0	2	0	1							2	5	0
0600	0	0	0	0	0	1	2	1	1	1	2	2	0	0	1							1	5	0
0700	2	1	0	0	0	0	1	0	0	0	-1	3	2	2	2							1	5	0
0800	4	1	0	1	3	0	1	0	0	0	0	1	2	0			1	0	2	0	0	0	0	0
0900	0	0	0	0	2	1	0	0	0	2	0	1	2	0			3	0	0	0	2	0	0	0
1000	1	1	8	4	1	0	1	0	0	0	0	0	0	1			1	0	0	0	0	0	0	1
1100	1	1	6	5	1	2	1	1	1	0	0	2	2	0		0	2	0	4	1	0	0	0	0
1200	0	1	2	2	1	0	1	0	0	3	0	0	2	1			2	3	2	1	0	1	0	1
1300	2	5	0	3	3	0	3	3	0	1	0	0	0	0			6	0	0	0	1	0	3	0
1400	1	3	1	3	5	0	3	0	0	0	5	0	1	2		8	0	-1	2	2	2	1	4	2
1500	4	3	1	1	7	5	3	2	1	11	1	7	2	3		14	1	0	2	1	1	0		1
1600	2	3	3	0	8	3	4	41	0	17	13	4	2	5	8	18	1	0	2	0	0			5
1700	8	3	14	2	3	1	6	21	2	12	9	6	1	4	18	15	3	1	3	-1	0			0
1800	7	0	1	6	6	7	4	10	1	10	10	1	0	3	76	20	1	2	0	5	2			11
1900	1	1	0	3	4	4	10	14	1	-1	17	2	39	44	46	10	3	4	5	0	0			2
2000	0	0	2	4	8	3	3	11	3	3	51	4	13	12	43	16	2	1	8	2	0			6
2100	11	0	1	2	6	15	13	6	0	1	3	10	9	6	79	32	0	5	4	3	6			2
2200	2	0	0	6	5	14	10	43	0	19	6	8	17	11	61	30	5	6	2	3	3		34	4
2300	2	5	3	4	13	11	2	11	0	12	0	3	3	3	4	9	11	4	1	1	0	9	7	4
	81	*44* [a]	50	46	76	68	*90*	183	26	107	130	*68*	*119*	112	346	172	*42*	25	37	18	17	39	*106*	118

Appendix A.5. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	3	7	3	5	9	12	1	2	1	5	4	2	2	5	1	0	0	1	0	0	0	2	1	0
0100	19	3	4	11	4	7	14	8	0	0	0	4	2	2	1	1	0	0	0	0	0	0	0	0
0200	19	13	9	12	10	5	19	12	1	-1	8	3	3	2	1	2	0	0	0	0	0	0	0	0
0300	13	1	10	0	2	2	6	2	0	0	3	1	2	3	0	0	0	1	0	0	0	0	0	0
0400	5	3	2	0	0	1	1	3	0	1	0	1	1	2	2	0	0	0	0	1	0	0	0	0
0500	5	0	1	0	0	1	1	-2	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0600	0	0	6	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	1	0	0	0	1	-1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	*0*
0800	0	1	0	0	0	0	0	0	0	0	0	0	3	-1	0	0	0	0	0	0	0	0	-1	0
0900	0	0	0	2	0	0	-1	-1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0
1100	1	0	2	2	0	1	2	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	1	1	0	4	-1	0	-1	0	0	0	0	0	1	-2	0	0	0	0	0	0	0	0	0	
1300	2	2	0	6	0	0	0	0	-1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	
1400	2	0	1	2	1	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0	1	0	
1500	7	0	0	1	0	1	0	0	1	-1	1	0	0	1	2	0	0	0	0	0	0	0	0	
1600	0	1	0	0	2	1	4	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
1700	0	1	10	0	1	5	2	3	2	3	0	0	1	0	0	0	0	0	0	0	0	0	0	
1800	1	0	6	3	1	-1	3	2	1	1	0	0	2	0	1	0	0	0	0	0	0	0	0	
1900	0	0	7	1	0	4	2	1	2	0	0	0	2	0	1	0	0	0	0	1	0	0	0	
2000	2	0	0	6	4	1	5	0	5	1	0	1	5	1	0	0	1	0	0	1	2	0	0	
2100	2	0	4	7	6	5	2	1	1	0	1	0	2	0	0	0	-1	0	0	1	0	0	0	
2200	1	3	13	16	3	0	5	2	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	
2300	0	1	5	3	3	6	1	2	0	0	0	2	0	0	1	0	0	0	0	0	0	1	0	
	84	37	83	84	45	54	70	37	16	12	21	14	29	16	12	3	0	4	0	4	3	6	0	*0* [a]

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.6. Unexpanded counts of chum salmon from right bank of Kanektok River, 1997.

Time	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul
0000	0	0		0	1	0	0	6	5	0	1	0	2	3	7	0	4	19	46	28	18	33	20	16
0100	0	0		0	0	0	0	1	2	0	0	2	0	0	1	4	3	10	31	4	13	11	18	9
0200	0	1		0	1	0	1	1	1	0	0	0	0	1	2	2	0	17	16	4	7	7	17	27
0300	0	0		0	1	0	0	0	0	1	0	0	0	1	3	1	3	11	26	5	6	8	27	2
0400	0	0		0	0	1	0	5	1	0	1	0	0	0	0	1	0	9	21	3	3	6	13	4
0500	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	2	0	2	10	3	3
0600	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	7	2	7	2	1
0700	1	0		0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	2	5	2	2	5	4
0800	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	2	3
0900	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	8	4	7	2
1000	0	0		0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	11	15	2	152	1
1100	0	0		0	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	33	7	48	18	4
1200	0			0	0	0	0	0	0	0	0	0	0	0	1	1	5	2	0	79	0	33	27	2
1300	0			0	0	1	0	0	0	0	0	0	0	2	2	1	2	1	7	102	87	47	15	4
1400	0			0	0	0	0	0	0	0	0	0	0	4	1	3	1	22	5	86	47	48	14	1
1500	0			0	0	0	0	0	0	0	0	0	0	3	5	2	9	7	5	31	43	49	12	0
1600	0			0	0	0	0	0	0	0	0	0	0	3	2	1	9	31	16	48	20	54	12	39
1700	0			0	0	0	0	0	0	0	0	1	9	2	1	0	9	24	11	30	14	54	9	7
1800	0				2	0	0	0	0	0	0	2	9	2	0	0	10	5	5	54	75	41	10	9
1900	0				0	0	0	0	0	0	0	0	0	0	0	0	23	9	15	28	46	59	4	3
2000	0				0	0	0	0	4	0	0	2	0	0	1	0	19	15	9	12	48	60	11	3
2100	0				0	0	0	1	3	0	0	0	0	5	0	0	3	9	12	17	69	29	38	6
2200	0				0	0	0	0	1	0	0	0	0	2	2	0	23	29	5	12	34	9	33	2
2300	0				0	0	0	0	1	0	0	1	0	8	2	10	27	60	8	3	27	36	10	9
	1	1	0	0	*8* [a]	2	1	*13*	*21*	1	*2*	8	20	40	30	26	*151*	292	244	641	594	657	479	161

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.6. (page 2 of 3).

Time	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	13	8	28	3	1	1	5	12	3	4	8	9	1	5	7							0	1	46
0100	6	*20*	0	0	2	2	19	17	14	6	2	0	2	13	3							2	12	36
0200	10	*20*	4	1	4	4	33	19	1	2	11	3	5	5	2							11	12	12
0300	3	0	5	0	1	1	10	6	1	3	9	1	7	6	5							6	4	1
0400	6	0	0	0	0	0	2	0	0	1	1	4	3	5	2							1	-1	3
0500	3	4	2	0	0	0	8	2	2	1	3	3	4	2	2							1	*3*	2
0600	0	7	0	3	4	3	1	1	2	3	4	0	0	0	4							2	*3*	2
0700	4	1	0	0	0	1	17	0	0	0	0	1	0	1	0							0	*3*	0
0800	2	17	3	2	4	1	1	0	0	1	0	*1*	*2*	1			3	0	0	0	1	1	0	1
0900	2	*5*	3	2	3	2	0	0	0	4	0	*1*	2	1			0	1	0	0	0	0	0	1
1000	0	14	18	4	2	0	*2*	0	1	3	0	0	1	0			0	0	0	0	0	1	0	0
1100	0	1	3	5	1	2	*2*	0	0	0	0	0	2	0		4	1	1	2	0	0	2	1	0
1200	0	1	7	17	6	2	*2*	0	0	0	0	0	2	0			4	0	1	0	0	0	0	0
1300	0	2	7	19	10	3	2	1	0	0	0	0	0	0			3	0	0	1	-1	0	0	0
1400	1	0	21	14	8	2	*4*	1	1	4	0	1	2	0		2	0	1	2	1	0	0	0	1
1500	0	24	4	3	13	0	*4*	2	2	-1	0	0	3	0		8	2	2	0	0	2	0		-1
1600	4	3	1	4	1	3	5	25	0	4	3	*2*	0	0	0	0	*3*	0	1	0	1			3
1700	22	17	23	2	9	0	6	3	0	11	3	0	2	0	0	4	6	0	0	0	0			0
1800	47	6	0	9	4	1	12	4	0	13	2	8	1	0	3	4	3	4	0	1	0			23
1900	47	16	1	0	8	9	9	0	0	5	5	3	7	6	6	5	5	5	5	1	0			6
2000	1	10	0	5	11	2	8	5	0	6	11	-1	8	8	52	8	8	7	3	0	0			1
2100	37	25	4	2	1	0	0	2	0	3	0	22	10	6	50	21	14	1	12	-1	0			12
2200	31	54	5	7	3	1	1	66	0	4	1	14	1	2	37	11	11	5	17	1	0		6	6
2300	69	51	8	15	9	3	3	107	0	6	18	2	5	4	41	8	4	8	14	0	2	7	6	6
	308	*306* [a]	147	117	105	43	*156*	273	27	83	81	*74*	*70*	65	214	75	*67*	35	57	4	5	34	*50*	161

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.6. (page 3 of 3).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	25	7	5	19	8	2	2	9	9	7	4	1	5	3	2	1	3	0	1	0	0	0	1	0
0100	18	4	10	8	1	5	21	2	6	0	4	3	3	3	0	4	0	1	1	1	0	0	0	0
0200	19	8	0	8	7	3	5	8	3	3	2	2	2	1	0	3	0	0	0	1	0	0	0	0
0300	12	4	11	3	4	3	3	9	1	2	2	1	2	0	0	1	0	0	0	2	0	0	-1	0
0400	5	1	6	2	0	3	1	4	2	3	4	3	0	0	2	0	0	2	0	0	0	0	0	0
0500	0	-1	3	1	1	2	0	1	0	1	0	1	0	0	1	0	0	-1	0	-1	0	0	1	0
0600	1	0	1	0	0	0	0	0	1	0	0	-1	2	0	0	0	0	2	0	-1	0	0	0	0
0700	2	0	0	1	0	1	0	2	0	1	1	0	0	3	0	0	0	0	1	0	2	0	1	*0*
0800	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0
0900	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
1000	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	2	1	0	0	0	0	0	-1	0	-1	1	0	0	0	1	0	0	
1200	0	0	0	1	0	1	0	2	0	0	0	0	0	0	1	0	-2	0	0	0	0	0	0	
1300	1	0	0	2	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	
1400	0	0	1	1	0	0	0	0	-3	2	1	1	0	1	0	0	0	0	0	0	0	0	1	
1500	1	0	0	2	0	0	0	0	0	1	0	0	0	3	1	1	0	0	0	0	1	0	0	
1600	0	0	0	0	2	0	3	0	0	0	1	0	1	0	0	0	0	2	0	0	0	1	0	
1700	1	0	0	0	0	0	1	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	
1800	0	2	1	0	0	0	1	1	1	0	0	1	0	0	0	1	0	0	1	0	1	0	0	
1900	0	0	1	1	0	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0	2	0	1	
2000	1	0	1	0	2	0	2	2	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	
2100	0	0	3	3	1	-2	2	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	
2200	0	0	1	2	4	1	8	0	3	1	0	3	0	0	0	0	2	0	0	0	2	0	0	
2300	1	0	2	2	1	2	7	2	0	4	0	0	0	0	0	0	3	0	0	0	0	0	0	
	88	25	47	56	31	23	61	44	28	28	21	16	16	14	8	11	7	9	5	3	12	1	4	*0* [a]

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.7. Unexpanded counts of pink salmon from left bank of Kanektok River, 1997.

Time	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	0	0	0	2	0	1	0	1	4	0	0	1	0	0							0	1	0
0100	*0*	0	0	0	0	0	0	5	4	0	0	0	0	0							0	2	2
0200	*0*	0	0	0	0	2	1	1	5	0	0	0	0	0							0	0	1
0300	0	0	0	0	0	2	0	1	2	4	0	0	0	0							0	1	1
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
0500	0	0	0	0	1	0	0	2	0	0	0	0	0	0							0	*1*	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0							0	*1*	0
0700	0	0	0	0	0	0	0	0	0	1	0	0	0	0							0	*1*	0
0800	0	1	0	0	0	2	0	0	0	0	*0*	*0*	0			0	0	0	0	0	0	0	0
0900	0	0	0	0	0	0	0	0	1	0	*0*	*0*	0			0	1	0	0	0	0	0	0
1000	0	1	1	0	0	*0*	0	0	1	0	0	0	0			0	0	0	1	0	0	0	0
1100	0	0	3	1	0	*0*	0	0	0	0	2	*0*	0		0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	*0*	0	0	0	0	0	2	0			0	0	0	0	0	0	0	0
1300	0	0	7	0	0	1	0	0	0	0	0	0	0			1	0	0	2	0	0	2	1
1400	0	0	0	1	0	*0*	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
1500	0	0	0	1	0	*0*	0	0	1	0	0	0	0		1	0	0	0	0	0	0		2
1600	0	1	0	2	0	0	0	0	2	2	*0*	0	0	0	0	*0*	0	0	1	-1			1
1700	0	3	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	1	1			0
1800	0	1	7	0	0	0	0	0	2	0	1	0	0	0	0	0	1	0	2	0			2
1900	0	0	2	0	0	0	0	0	1	0	0	0	4	0	3	2	0	1	1	0			1
2000	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	3	0	0	2	0			2
2100	0	1	0	0	0	0	0	0	1	0	1	0	0	0	2	0	1	0	1	0			1
2200	0	4	0	1	1	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0		1	0
2300	0	3	0	0	0	0	0	0	2	0	0	0	0	0	0	2	2	0	0	0	1	0	1
	0 [a]	15	20	8	2	*8*	1	10	27	10	*4*	*3*	4	0	10	*8*	10	1	12	0	1	*10*	15

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.7. (page 2 of 2).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	2	0	0	0	0	0	2	1	-1	0	1	0	0	1	1	0	1	0	1	1	-1	1	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0
0200	1	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	1	0
0300	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0
0400	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-1	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	-1	0	0	0	0
0700	1	0	0	0	0	0	3	-1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
0800	0	0	0	0	0	0	-1	0	-1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
0900	0	0	1	0	0	0	-1	0	0	0	1	0	1	0	0	0	0	0	1	0	1	1	0	0
1000	0	0	0	0	0	0	-1	0	1	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
1100	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	
1200	0	0	0	1	0	0	0	1	-1	0	0	0	-1	0	0	0	0	1	0	0	1	0	1	
1300	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	1	
1400	1	0	0	2	0	1	0	2	0	0	1	0	0	0	1	0	0	2	0	0	1	1	0	
1500	2	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	2	0	1	1	2	0	1	
1600	0	1	1	0	0	0	1	0	1	2	0	0	1	1	0	0	0	0	1	0	2	0	0	
1700	0	2	1	0	0	0	1	0	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	
1800	0	0	1	0	0	0	4	1	1	1	0	0	5	0	0	0	2	1	0	0	0	0	0	
1900	0	0	0	0	0	0	2	0	3	0	0	0	1	1	0	2	-2	0	0	1	0	0	0	
2000	0	0	2	0	3	1	1	1	1	0	0	0	3	0	0	0	0	0	0	0	2	1	2	
2100	0	0	2	1	1	0	3	2	0	0	1	0	0	2	0	0	0	0	0	0	1	0	0	
2200	0	0	3	1	1	0	2	1	2	1	1	2	0	0	0	0	1	0	1	3	0	0	0	
2300	0	0	0	1	0	0	3	3	0	2	0	1	0	0	0	1	1	0	0	3	1	0	1	
	10	4	12	7	5	3	19	11	9	9	7	5	10	6	4	4	6	5	9	12	10	6	8	*0* [a]

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.8. Unexpanded counts of pink salmon from right bank of Kanektok River, 1997.

Time	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul
0000	0	0	0	0	6	8	8	6	2	0	0	0	0	0							0	2	0
0100	*0*	0	0	6	3	10	5	7	5	0	5	0	6	0							0	0	1
0200	*0*	0	0	8	2	9	7	4	6	0	0	5	0	0							0	2	1
0300	0	0	0	5	0	8	1	1	1	1	1	3	0	0							0	1	0
0400	0	0	0	9	0	4	1	0	0	0	0	2	3	0							0	0	0
0500	0	0	0	4	0	3	0	17	17	0	0	1	0	0							0	*0*	0
0600	0	0	0	13	2	0	1	6	10	0	2	4	0	0							0	*0*	2
0700	0	0	0	7	0	3	0	3	5	0	1	3	0	3							0	*0*	0
0800	1	0	5	0	0	2	0	0	9	0	*2*	*2*	0			0	0	2	0	0	0	0	0
0900	0	0	4	0	1	0	0	0	2	0	*2*	*2*	0			1	0	0	0	0	0	0	0
1000	0	2	2	0	0	*1*	0	0	1	0	1	0	0			0	0	0	2	0	0	0	0
1100	0	0	4	1	0	*1*	1	0	0	0	4	*2*	1		0	0	0	0	0	0	0	0	0
1200	0	1	12	0	3	*1*	0	0	0	1	1	0	0			0	0	4	0	1	0	0	0
1300	0	3	17	0	0	3	0	0	0	1	5	0	0			0	0	0	3	0	1	0	0
1400	0	2	23	0	0	*2*	0	0	0	0	4	0	0		0	0	3	0	0	2	2	0	0
1500	0	0	2	1	0	*2*	0	0	0	0	0	0	0		0	3	2	3	0	1	0		1
1600	0	5	3	1	0	0	0	0	4	0	*3*	0	0	0	0	*2*	2	0	2	1			0
1700	0	12	0	3	0	3	0	0	2	3	0	0	0	0	0	5	2	0	0	0			0
1800	0	3	8	1	0	0	0	0	10	1	7	0	0	1	0	1	6	0	1	1			1
1900	0	7	0	0	3	3	0	0	5	4	0	0	0	2	0	0	1	3	0	0			0
2000	0	0	4	0	1	0	0	0	3	6	0	13	0	4	1	1	2	1	0	0			0
2100	0	24	6	0	0	0	0	0	2	0	0	11	0	7	5	1	4	3	0	0			1
2200	0	22	3	1	0	0	0	0	0	0	0	0	0	0	2	1	1	6	1	0		0	0
2300	0	28	13	0	0	0	0	0	1	0	0	0	0	0	0	3	2	1	1	1	0	0	2
	1 [a]	109	106	60	21	*63*	24	44	85	17	*38*	*49*	10	17	8	*18*	25	23	10	7	3	5	9

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.8. (page 2 of 2).

Time	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	3	0	0	1	0	0	1	0	0	1	0	0	1	0	0	2	0	2	0	0	0	1	1
0100	2	0	1	0	0	0	3	0	1	0	4	0	0	0	1	0	0	0	0	1	0	0	0	0
0200	1	1	1	1	1	0	3	3	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0
0300	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
0400	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
0500	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	1	0	1	0	0
0600	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	1	0	0	0	0
0700	0	1	1	0	1	0	1	0	0	0	0	0	0	1	1	0	-1	0	0	0	0	0	0	*0*
0800	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	1	1	0	0	0	0	0	1	0
0900	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	3	0	0	0	0	0	0	1	1	-1	0	-1	1	1	0	1	0	0
1100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	0	0	0	1	0	0	0	2	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	
1300	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	
1400	0	1	2	2	0	0	1	2	0	0	0	0	0	0	0	-1	-2	1	0	0	1	0	1	
1500	2	0	2	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	1	0	
1600	0	2	0	0	0	0	2	1	1	2	0	0	0	2	0	0	1	0	0	1	0	0	0	
1700	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	
1800	0	0	1	0	0	0	2	0	2	0	2	0	0	0	1	1	1	1	1	1	1	0	-2	
1900	0	1	0	0	0	0	0	0	1	1	1	0	1	0	0	0	1	0	2	0	0	0	1	
2000	0	0	0	0	2	0	1	0	2	1	0	0	0	0	0	0	2	0	1	0	0	0	1	
2100	0	0	2	0	3	0	0	1	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	
2200	0	1	1	0	0	1	3	2	2	0	1	0	0	0	0	0	1	0	1	2	0	0	0	
2300	0	0	1	0	3	3	2	1	1	4	0	2	0	0	0	0	0	1	1	0	1	1	0	
	7	13	14	5	11	7	21	20	13	11	12	5	1	7	6	2	9	2	9	11	5	7	4	*1* [a]

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.9. Unexpanded counts of coho salmon from left bank of Kanektok River, 1997.

Time	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	0	0	0	0	3	2	0	1	2	2	1	3	21	11	11	2	11	3	14	18	5	4	10	3
0100	0	0	1	0	1	0	3	0	1	2	0	1	0	8	10	7	4	8	3	1	11	8	5	11	3
0200	0	0	0	0	2	0	0	3	2	1	1	4	1	3	3	7	4	1	1	0	2	2	0	5	1
0300	0	0	0	0	0	1	1	0	1	-1	1	2	1	4	1	3	2	1	0	0	3	0	1	0	1
0400	0	0	0	1	0	0	1	0	0	0	1	0	0	2	2	3	0	0	0	0	0	2	0	1	0
0500	0	0	1	0	1	0	0	0	0	0	0	0	0	-1	0	3	0	0	0	1	1	0	1	0	0
0600	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	1	1	0	0	0	3	0	6	3	2	0	1	0	5	1	1	0	3	*0*
0800	0	0	0	0	0	0	0	0	1	0	0	1	1	4	4	7	2	1	2	3	2	1	2	4	0
0900	0	0	0	0	0	0	1	1	0	0	2	2	0	5	2	11	2	2	1	1	2	3	0	2	0
1000	0	0	0	0	1	0	1	0	1	2	0	0	0	4	1	23	6	1	9	0	1	1	3	2	0
1100	0	0	0	0	0	0	1	4	0	1	0	0	0	4	6	8	3	0	4	0	2	0	0	1	
1200	0	0	1	0	0	0	4	4	4	2	1	0	2	6	8	30	8	0	7	1	2	2	1	14	
1300	0	0	0	0	3	0	1	3	1	1	0	2	0	12	10	22	14	1	19	0	1	1	1	2	
1400	0	0	0	0	0	0	0	2	5	3	1	2	1	2	9	26	1	2	12	6	3	2	4	23	
1500	0	0	0	0	1	0	0	2	1	4	1	3	2	10	31	27	11	5	8	0	3	1	5	15	
1600	1	0	0	0	0	0	1	4	2	3	2	0	6	31	41	11	17	8	1	7	4	9	4	74	
1700	0	0	0	1	0	0	0	4	3	1	4	0	4	25	10	24	6	11	1	8	5	16	7	26	
1800	0	0	0	2	0	0	2	5	3	4	4	1	5	23	41	14	14	21	6	2	24	30	4	64	
1900	0	0	0	1	1	0	1	4	2	3	1	0	18	8	21	22	7	28	13	12	14	25	9	29	
2000	0	0	0	2	0	3	1	2	1	2	2	1	23	17	10	8	14	14	11	20	13	23	10	20	
2100	0	0	1	0	0	21	4	5	5	3	1	0	6	12	5	13	10	5	10	4	9	17	3	19	
2200	0	0	0	1	0	2	1	6	2	2	0	0	30	24	21	2	10	10	52	17	12	18	11	19	
2300	0	0	0	0	0	7	5	8	2	3	1	5	14	15	20	2	7	7	11	23	0	23	7	5	
	1	0	4	8	10	38	32	58	38	38	25	28	117	245	270	286	144	138	174	125	133	190	82	349	*8* [a]

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.10. Unexpanded counts of coho salmon from right bank of Kanektok River, 1997.

Time	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	0	0	0	0	0	1	3	5	2	2	6	2	11	5	4	2	9	3	11	8	6	7	14	4
0100	0	0	0	0	0	0	2	2	1	0	0	5	3	7	3	6	8	10	2	6	13	3	5	10	14
0200	0	0	0	0	0	2	2	0	5	1	1	5	0	0	1	3	2	3	5	0	2	0	1	2	4
0300	0	0	0	0	0	1	0	0	4	1	1	0	1	0	0	1	1	2	0	1	0	0	0	1	2
0400	0	0	0	0	0	0	0	0	1	3	1	1	1	1	0	1	0	0	0	3	0	0	0	0	1
0500	0	0	0	0	0	2	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0
0700	0	0	0	0	0	0	0	2	1	0	0	1	0	11	4	2	2	0	0	3	0	1	1	0	1
0800	0	0	0	0	0	0	0	0	0	1	0	0	2	3	0	2	1	0	1	1	1	0	0	0	1
0900	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	0	0	1	1	2	2	2	0	4
1000	0	0	0	0	0	0	0	2	1	0	0	0	0	1	5	1	3	0	5	1	0	0	0	3	4
1100	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	2	0	1	1	1	3	
1200	0	0	0	0	0	0	0	1	3	3	0	3	0	0	3	1	4	1	0	2	0	0	5	8	
1300	0	0	0	0	0	0	0	4	2	1	0	0	2	0	1	4	3	1	0	3	0	1	0	10	
1400	0	0	0	1	0	0	0	2	2	1	0	1	2	3	0	3	0	1	0	0	0	1	2	7	
1500	0	0	0	0	0	0	0	1	2	1	5	1	5	4	5	7	2	1	1	1	4	0	2	9	
1600	0	0	0	0	0	0	0	2	1	1	1	0	4	3	0	3	2	2	3	2	0	7	3	11	
1700	0	0	2	0	0	0	0	1	0	3	0	0	4	8	0	5	1	2	1	3	3	5	3	9	
1800	0	0	0	0	0	0	0	2	0	3	2	2	3	5	5	16	15	10	6	4	0	6	2	10	
1900	0	0	0	0	0	0	0	1	0	2	2	0	0	1	5	8	16	6	13	6	0	11	5	11	
2000	0	0	0	0	0	0	0	0	2	3	2	1	0	2	2	2	0	8	11	0	6	22	6	25	
2100	0	0	0	1	0	0	0	1	2	2	0	1	0	4	3	2	4	4	10	7	15	8	10	23	
2200	0	0	0	0	0	0	1	4	1	5	0	1	4	3	4	2	2	5	25	9	17	24	4	16	
2300	0	0	0	0	0	3	1	5	1	0	9	0	58	12	7	4	7	7	12	11	3	2	9	32	
	0	0	2	2	0	8	7	34	37	33	26	28	93	81	73	79	77	73	110	75	75	100	69	204	35 *

Appendix A.11. Unexpanded counts of unknown salmon from left bank of Kanektok River, 1997.

Time	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul
0000	0	0	0							8	0	0	0	0	0	0	0	0	0
0100	0	0	1							0	0	*0*	0	2	1	0	0	0	0
0200	0	0	0							0	0	0	0	1	0	0	0	0	0
0300	0	0	0							0	0	0	0	0	0	0	0	0	0
0400	0	0	0							0	0	0	0	0	0	0	0	0	0
0500	0	0	0							1	0	0	0	0	0	0	0	0	0
0600	0	2	0							0	0	0	0	0	0	0	0	0	0
0700	0	3	0							0	0	0	0	0	0	0	0	0	0
0800	0	0	0							0	1	0	0	0	0	0	0	0	0
0900	0	0	0							2	1	0	0	0	0	0	0	0	1
1000	0	0	0							2	0	1	5	0	0	0	*0*	0	0
1100	0	1	0							4	0	1	2	0	0	0	*0*	0	0
1200	0	0								3	0	0	0	0	0	0	*0*	0	0
1300	0	0								2	1	0	0	0	0	0	0	0	0
1400	0	0							0	0	0	1	0	0	0	0	*0*	0	0
1500	0	0							0	3	1	0	0	0	0	0	*0*	0	0
1600	0	0							0	0	1	1	0	0	0	0	0	0	0
1700	0	0							0	0	4	0	0	0	0	0	0	0	0
1800	2	1							0	0	10	0	0	0	0	0	0	0	0
1900	0	0							2	0	0	0	0	0	0	0	0	0	0
2000	0	0							0	0	0	0	0	1	0	0	0	1	0
2100	2	0							0	0	0	0	0	0	3	0	0	0	0
2200	3	0							0	1	0	0	0	0	0	0	0	0	0
2300	2	0							0	0	0	0	0	0	7	0	0	0	0
	9	7	1	0	0	0	0	0	2	26	19	*4* [a]	7	4	11	0	*0*	1	1

[a] Counts in italics indicate an interpolation occurred for one or more missing counts.

Appendix A.11. (page 2 of 3).

Time	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug
0000	0	0	0	0	0	0							0	0	0	0	0	0	0
0100	0	0	0	0	0	0							0	0	0	0	0	0	0
0200	0	0	0	0	0	0							0	1	0	0	0	0	0
0300	0	0	0	0	0	0							0	0	0	0	0	0	0
0400	0	0	0	0	0	0							0	0	0	0	0	0	0
0500	-1	0	0	0	0	0							0	*0*	0	0	0	0	0
0600	0	0	0	0	0	0							0	*0*	0	0	0	0	0
0700	0	0	0	0	0	0							0	*0*	0	0	0	0	0
0800	0	0	*0*	*0*	0			0	0	0	0	0	0	0	0	0	0	0	0
0900	4	0	*0*	*0*	0			0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	*0*	0		5	0	0	0	0	0	1	0	0	0	0	0	0
1200	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0		2	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0		5	0	0	0	0	0	1		0	0	0	0	0
1600	0	0	*0*	0	1	0	4	0	0	0	0	0			0	0	0	0	0
1700	3	0	0	0	0	0	2	0	0	0	0	1			0	0	0	0	0
1800	0	0	0	0	0	0	2	0	1	0	0	0			0	0	0	0	0
1900	0	0	0	0	0	0	3	0	0	0	0	0			0	0	0	0	0
2000	0	0	0	0	0	0	2	0	0	0	0	0			0	0	0	0	0
2100	2	1	0	0	0	0	0	0	0	0	1	0			0	0	0	0	0
2200	0	1	0	0	0	3	1	0	0	0	0	0		3	0	0	0	0	0
2300	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0
	8	2	*0* [a]	*0*	1	3	28	0	1	0	1	1	3	*4*	0	0	0	0	0

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.11. (page 3 of 3).

Time	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	0	0	1	1	1	0	0	0	4	2	0	0	0	0	0	0	0	0	0
0100	0	0	0	3	0	0	0	0	0	3	1	4	0	0	0	0	0	0	0	0
0200	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	2	1	-1	0	0	0	0	0	0	0	0
0400	0	0	0	1	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	1	0	0	0	0	1	0	-1	0	0	0	0	0	0	0	0
0700	0	0	0	0	1	0	0	0	0	2	1	-1	0	0	0	0	0	0	0	*0*
0800	0	0	0	0	0	0	0	0	3	0	3	1	0	0	0	1	0	0	0	0
0900	1	1	0	0	0	0	0	0	0	2	4	0	0	0	0	1	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	
1200	0	0	0	1	0	0	0	0	0	0	2	1	0	0	0	2	0	0	0	
1300	0	0	0	0	0	0	0	0	0	1	3	3	0	0	0	0	0	0	0	
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
1500	0	0	0	0	0	0	0	0	1	4	3	0	0	1	0	0	0	0	0	
1600	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1700	0	2	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	
1800	0	2	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	
1900	0	1	2	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
2000	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2100	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2300	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
	1	10	5	15	4	1	0	0	4	25	28	7	2	2	2	5	0	0	0	*0* [a]

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.12. Unexpanded counts of unknown salmon from right bank of Kanektok River, 1997.

Time	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul	03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul
0000	0	1	5	0	0	3	6	0	22	0	0	0	0	1	0	0	0	0	0
0100	0	2	0	0	1	3	15	5	17	0	0	*0*	0	0	0	0	0	0	0
0200	0	0	0	0	3	24	4	1	18	0	0	*0*	0	0	0	0	1	0	0
0300	0	0	0	0	0	2	3	8	26	0	0	0	0	0	0	1	1	0	0
0400	0	2	0	2	0	6	0	11	15	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
0600	0	0	1	12	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0700	0	1	0	-2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0800	0	0	0	0	0	2	1	1	1	2	0	0	0	0	0	0	0	0	1
0900	0	0	0	1	0	4	2	3	3	0	1	0	0	0	0	0	0	0	0
1000	0	0	1	1	0	1	1	0	37	0	1	2	4	0	0	0	*0*	0	0
1100	0	0	0	1	0	5	0	11	6	0	1	0	1	0	0	0	*0*	0	0
1200	0	0	0	2	-2	31	0	6	7	0	0	0	2	2	0	0	*0*	0	0
1300	0	0	0	0	5	43	28	22	8	0	0	0	1	1	0	8	0	0	0
1400	0	0	0	2	0	11	21	14	0	0	0	0	0	0	0	2	*1*	0	0
1500	0	0		0	7	16	15	13	0	1	3	1	0	0	0	0	*1*	5	0
1600	0	0		0	0	11	5	22	20	0	3	0	1	0	0	0	0	2	0
1700	0	0		0	0	17	4	11	3	0	4	0	0	0	0	0	0	0	0
1800	0	0	0	2	1	12	13	8	0	0	5	0	0	3	0	0	0	0	0
1900	0	0	0	2	0	7	8	15	0	3	0	0	0	0	0	0	0	0	0
2000	0	0	0	2	10	3	6	13	0	0	0	0	0	1	0	0	0	0	0
2100	1	0	0	0	2	7	3	12	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	33	0	0	3	0	0	9	0	0	0	0	0
	1	6	7	25	33	212	135	215	187	6	21	3 [a]	9	17	0	11	*4*	7	1

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.12. (page 2 of 3).

Time	14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug
0000	0	0	0	0	0	0							0	0	0	0	0	0	0
0100	0	0	0	0	0	0							0	0	-1	0	0	0	0
0200	0	0	0	0	0	0							0	2	0	0	0	0	0
0300	0	0	0	0	0	0							0	1	0	0	0	0	0
0400	0	0	0	0	0	0							0	0	0	0	0	0	0
0500	0	0	0	0	0	0							0	*0*	0	0	0	0	0
0600	0	0	0	0	0	0							0	*0*	0	0	0	0	0
0700	0	0	0	0	0	0							0	*0*	0	0	0	0	0
0800	0	0	*0*	*0*	0			0	0	0	0	0	0	0	0	0	0	0	0
0900	0	0	*0*	*0*	0			0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	*0*	0		4	0	0	0	0	0	0	1	0	0	0	0	0
1200	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0		2	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0		-2	0	0	0	0	0	0		1	0	0	0	0
1600	0	0	*0*	0	0	0	0	0	0	0	0	0			0	0	0	0	0
1700	0	0	0	0	0	1	0	0	0	0	0	1			0	0	2	0	0
1800	0	0	0	0	0	5	0	0	0	0	0	0			0	0	0	0	0
1900	0	0	0	0	0	0	2	0	1	0	0	0			0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0
2100	0	3	0	0	0	1	1	0	0	0	0	0			0	0	0	0	0
2200	0	0	0	0	0	3	1	0	0	0	0	0		0	0	0	0	0	0
2300	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
	0	4	*0*[a]	*0*	0	11	10	0	1	0	0	1	0	*4*	0	0	2	0	0

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix A.12. (page 3 of 3).

Time	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug	07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug
0000	0	0	0	0	0	0	1	0	0	2	1	1	0	0	0	0	0	0	0	0
0100	0	0	0	2	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0
0200	0	0	0	3	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0
0300	0	0	0	4	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0400	0	0	0	1	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0
0500	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	*0*
0800	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	-1
0900	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1
1000	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1300	0	0	0	0	0	0	0	0	0	-1	0	1	0	0	0	0	0	0	0	
1400	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	
1500	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	
1600	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1700	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1800	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2000	0	2	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2100	0	1	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2300	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	
	0	7	5	23	2	0	1	1	2	16	7	5	2	0	2	0	1	2	0	*0* [a]

[a] Counts in italics indicate an intrerpolation occurred for one or more missing counts.

Appendix B.1. Kanektok River counting tower calibration counts, 1997.

Date	Time	Observer	Number of Kings	Number of Reds	Number of Chums	Number of Pinks	Number of Cohos	Number of Unknowns	Total
30-Jun	1900	Adolf	15	86	28			7	136
		Gary	12	82	28			18	140
Percent Difference			25.0	4.9	0.0			-157.1	-2.9
02-Jul	1600	Adolf	(9)	92	54			22	168
		Gary	No count [a]	106	27			41	174
Percent Difference				-15.2	100.0			-86.4	-3.6
02-Jul	2100	Adolf	(13)	55	29			12	96
		Gary	No count	49	18			22	89
Percent Difference				12.2	61.1			-83.3	7.9
03-Jul	1600	Peter	(12)	29	12	Both lost count of Unknowns-			41
	Right Bank	Gary	No count	27	8	lots of up & down movement			35
Percent Difference				7.4	12				17.1
03-Jul	1900	Peter	(3)	30	4				34
	Left Bank	Gary	No count	29	6			2	37
Percent Difference				3.4	-50.0				-8.8
03-Jul	1915	Peter		3	0			2	5
	Right Bank	Gary		2	0			2	4
Percent Difference				50.0				0.0	25.0
04-Jul	1700	Peter		31	7	Not a good count			38
	Right Bank	Gary		26	6				32
Percent Difference				19.2	16.7				18.8
04-Jul	1900	Peter		19	3			3	25
	Right Bank	Gary		19	3			2	24
Percent Difference				0.0	0.0			50.0	4.2
04-Jul	2200	Peter	(6)	20	9	1			30
	Left Bank	Gary	No count	19	9	2			30
Percent Difference				5.3	0.0	-100.0			0.0
04-Jul	2215	Peter		4	2				6
	Right Bank	Gary		3	2				5
Percent Difference				33.3	0.0				20.0
09-Jul	2100	Adolf		14	6			3	23
	Left Bank	Gary		17	7			1	25
Percent Difference				-21.4	-16.7			200.0	-8.7
09-Jul	2115	Adolf		16	1				17
	Right Bank	Gary		14	2			4	20
Percent Difference				14.3	-100.0				-17.6
10-Jul	0200	Peter		19	4	(2)			23
	Right Bank	Gary		14	3	No count		5	22
Percent Difference				35.7	33.3				4.5

-Continued-

Date	Time	Observer	Number of Kings	Number of Reds	Number of Chums	Number of Pinks	Number of Cohos	Number of Unknowns	Total
12-Jul	1800	Paul	6	9	10			0	25
	Left Bank	Gary	6	16	4			5	31
Percent Difference			0.0	-77.8	150.0				-24.0
12-Jul	1815	Paul	2	13	4			0	19
	Right Bank	Gary	1	15	3			2	21
Percent Difference			100.0	-15.4	33.3				-10.5
14-Jul	0900	Paul		7	4	(2)			11
	Right Bank	Gary		7	4	No count			11
Percent Difference				0.0	0.0				0.0
14-Jul	1900	Warren		-2	-1	(1)			-3
	Left Bank	Gary		-4	0	No count			-4
Percent Difference				100.0					33.0
14-Jul	1915	Warren	1	7	5	(5)	Not a good		13
	Right Bank	Gary	0	9	1	No count	count by Gary		10
Percent Difference				-28.6	400.0				30.0
18-Jul	1900	Sonny	5	49	44	(4)	Sonny's recorded count		98
	Left Bank	Gary	0	60	46	No count	different than on clicker		106
Percent Difference		There were no kings		-22.4	-4.5				-8.2
09-Aug	2100	Peter W.	1				6		7
	Left Bank	Gary	1				7		8
Percent Difference			0.0				-16.7		-14.3
09-Aug	2115	Peter W.							0
	Right Bank	Gary							0
Percent Difference									0.0
10-Aug	2000	Peter W.	1		5	3	17		26
	Left Bank	Gary	1		5	3	19		28
Percent Difference			0.0		0.0	0.0	-11.8		-7.7
10-Aug	2015	Peter W.					2		2
	Right Bank	Gary					2		2
Percent Difference							0.0		0.0
15-Aug	2000	David		1			11		12
	Left Bank	Gary		1			11		12
Percent Difference				0.0			0.0		0.0
15-Aug	2015	David					14		14
	Right Bank	Gary					14		14
Percent Difference							0.0		0.0

[a] No count means that this species was not counted during the calibration period due to limited hand-held counters.

Appendix B.2. Kanektok River sixty minute observations of salmon passage.

Date/ Time	Location/ Observer	Species	10 min	20 min	30 min	40 min	50 min	60 min	Total	10 min expanded [a]	Relative Bias
14-Jul 2000	Left Bank Gary	King	4	3	5	2	0	2	16	24	0.50
		Red	3	27	15	20	7	15	87	18	-0.79
		Chum	3	2	4	7	9	1	26	18	-0.31
14-Jul 2000	Right Bank Warren	King	0	0	2	1	3	1	7	0	-1.00
		Red	7	3	12	18	16	3	59	42	-0.29
		Chum	6	1	10	13	7	2	39	36	-0.08
19-Jul 1810	Right Bank Gary	King	2	1	0	0	3	2	8	12	0.50
		Red	6	9	3	4	3	6	31	36	0.16
		Chum	0	3	1	3	-3	3	7	0	-1.00
		Unknown	1	2	0	2	0	0	5	6	0.20
		Pink	0	0	0	0	0	1	1	0	-1.00
20-Jul 1610	Left Bank Gary	King	10	10	14	22	11	15	82	60	-0.27
		Red	27	26	44	26	13	13	149	162	0.09
		Chum	18	44	36	28	29	15	170	108	-0.36
		Unknown	4	3	4	0	3	2	16	24	0.50
12-Aug 1710	Left Bank Gary	King	1	1	0	0	0	0	2	6	2.00
		Red	0	0	0	1	1	0	2	0	-1.00
		Chum	0	0	0	1	0	1	2	0	-1.00
		Unknown	2	0	0	0	5	0	7	12	0.71
		Coho	24	17	5	16	22	14	98	144	0.47
		Pink	0	0	1	2	0	0	3	0	-1.00
20-Aug 1910	Left Bank Gary	Red	1	0	0	0	0	0	1	6	5.00
		Chum	0	2	2	3	2	2	11	0	-1.00
		Coho	29	43	17	24	48	20	181	174	-0.04

[a] The 10 minute expanded count is what the estimated passage for that hour would be by multipying by 6 the value of the first 10 minutes counted.

Appendix C.1. Kanektok River meteorological and hydrological observations, 1997.

Date	Time	Wind	Sky [a]	Precip. (inches)	Temperature (C) Air	Water	Water Color	Water Level (ft)
11-Jun	1705	SW 0-5	2	1			Chalky	2.2
12-Jun	1807	SW 5-10	3	1			Chalky	2.1
13-Jun	1600	S 10-15	4	1			Chalky	2.0
14-Jun	0730	E 0-5	1		9		Chalky	1.9
15-Jun	1630	E 10-15	1		20		Clear	1.8
16-Jun	0730	E 0-5	1		6		Clear	1.7
17-Jun	1715	E 10-15	2	2	16		Clear	1.65
18-Jun	1630	SW 10-15	4	1	14		Chalky	1.82
19-Jun	1723	NW 10-15	2		15		Chalky	1.76
20-Jun	2230	W 5-10	2		15		Clear	1.72
21-Jun	1100	SW 10-15	4		12		Clear	1.58
22-Jun	1102	SW 10-15	4		12		Clear	1.54
23-Jun	1045	NW 10-15	1		21		Clear	1.50
24-Jun	1100	E 0-5	2		21	15	Clear	1.46
25-Jun	1130	NW 0-5	2		21	13	Clear	1.39
26-Jun	1100	NE 0-5	1		19	11.5	Clear	1.36
27-Jun	1400	W 10	1		-	14	Clear	1.28
28-Jun	1100	NE 0-5	1		25	12	Clear	1.24
29-Jun	1300	SW 10-15	4	0.2	14	13	Clear	1.17
30-Jun	1100	NE 0-5	4		19	13	Clear	1.13
01-Jul	1215	NE 0-5	3		19	12	Clear	1.14
02-Jul	1032	Calm	2		18	14	Clear	1.14
03-Jul			No observation					
04-Jul	1130	SW 0-5	2		19	13	Clear	1.04
05-Jul	1100	W 5-10	1		HOT	13.5	Clear	0.95
06-Jul	1100	NNE 10-15	2		HOT	13.5	Clear	0.90
07-Jul	1100	NW 0-5	4		15	12	Clear	0.85
08-Jul	1030	SW 5-10	4		12	11.5	Clear	0.80
09-Jul	1125	SW 5-10	5	0.22	12	11	Clear	0.80
10-Jul	1145	SW 0-5	4		13	11	Clear	0.74
11-Jul	1100	N 10-15	1		15	12	Clear	0.68
12-Jul	1130	N 10	2		16	11.5	Clear	0.64
13-Jul	1100	N 5-10	3		15	11	Clear	0.59
14-Jul	1630	SW 5-10	3		19	13.5	Clear	0.52
15-Jul [b]	1630	SW 5-10	2			15	Clear	0.50
16-Jul	1400	NE 5	4	0.35		11.5	Clear	0.51
17-Jul	1200	Calm	4			11	Clear	0.46
18-Jul	1200	W 5	2; 5	0.13	WARM	12	Clear	0.46
19-Jul	1300	S 5-10	1		WARM	13.5	Clear	0.41
20-Jul	1200	Calm	4	None		11	Murky	0.58

-Continued-

Appendix C.1. (page 2 of 2).

Date	Time	Wind	Sky[a]	Precip. (inches)	Temperature (C) Air	Water	Water Color	Water Level (ft)
21-Jul	1130	Calm	3			12	Clear	0.65
22-Jul	1700	WSW 10-15	3			15	Clear	0.54
23-Jul	1230	SW 10	4			12.5	Clear	0.55
24-Jul	1700	W 10-15	4			14	Clear	0.65
25-Jul	1600	W 10-15	4	misty		12	Clear	0.56
26-Jul	1200	W 5	4			12	Clear	0.50
27-Jul	1130	Calm	3			12	Clear	0.51
28-Jul	1600	W 5-10	4			14.5	Clear	0.40
29-Jul	1130	SW 0-5	4			13	Clear	0.41
30-Jul	0930	SW 0-5	4		15	12	Clear	0.42
31-Jul	0830	Calm	4	0.5		12	Clear	0.44
01-Aug	0830	Calm	3		14	12	Clear	0.43
02-Aug	1000	ESE 15	2		12	12	Clear	0.45
03-Aug	1030	SE 10-20	2		16	12.5	Clear	0.41
04-Aug	1530	SE 15-20	3		23	16	Clear	0.46
05-Aug	1600	SE 10-15	4			15	Clear	0.41
06-Aug	1045	Calm	2		20	13.5	Clear	0.38
07-Aug	1230	S 0-3	2	0.05	25	15	Clear	0.33
08-Aug	1100	NE 0-5	3	0.08	17	14	Clear	0.31
09-Aug	1130	E 5	4	0.34	13	12	Clear	0.31
10-Aug	1230	S 15	4		15	11.5	Clear	0.49
11-Aug	1430	SW 10-15	4	0.4	14	12	Murky	0.90
12-Aug	0730	SW 10-25	4	0.5	12	11.5	Cloudy	0.94
13-Aug	1600	W 10-15	3	0.05	18	12.5	Murky	1.02
14-Aug	1245	S 10-15	4	int. mist	13	11	Murky	1.08
15-Aug	1400	W 5-10	2		18	12.5	Clearing	1.08
16-Aug	0730	W 0-5	4		10	12	Clear	1.06
17-Aug	1130	NW 5	4		11	11	Clear	1.01
18-Aug	0930	W 0-5	4		11	11	Clear	0.98
19-Aug	0830	NW 5	4			10	Clear	0.92
20-Aug	0830	SW 0-5	4	1.12		11	Clear	1.13
21-Aug	0930	SW 0-5	4	0.5		11.5	Murky	1.44
22-Aug	0700	Calm	4					1.42

[a] Sky code: 1 - Clear sky, cloud covering not more than 1/10 of sky, 2 - Cloud covering not more than 1/2 of sky, 3 - Cloud covering more than 1/2 of sky, 4 - Overcast, 5 -Fog or thick haze.

[b] Water gauge replaced at 1000, at what was estimated to be the same level as missing gauge.

Appendix C.2. Kanektok River water discharge profile, July 27, 1997.

DISCHARGE
AH-81-04

File No. 97KAN — Page 1 of 1
Crew L. DuBois — Date July 27, 1997
Habitat — Sampling — River — Meter
Location S04S74W35 — Site Kanektok Tower — Mile 5 — Type Price AA — No.
HUC 19030502 — Gage Number — Height 6 inches

Description: Sample site 5 river miles from mouth, 75 feet upstream of tower. Head pin RB facing downstream. Right bank 10 ft at 80°, grass and shrubs. Left bank gravel and sand, 75 ft to edge of channel and willows. Low water level.

Weather: 75 % overcast, air 16.5°C, water 13°C, 1330 hrs.

Distance from Head Pin (ft.) LB RB	Angle	Angle Coef.	Vel Depth (ft.)	Stream bed Elev.	Obs. Depth %	No. Revo-lutions	Time (sec)	Velocity fps: Point	Mean Vertical	Mean Cell	Mean Cell Depth (ft.)	Cell Width (ft.)	Cell Area (ft^2)	Flow (ft^3/s)
0			0.00					0.000						
5		1	0.32					0.352	(est.)	0.18	0.16	5	0.8	0.1
7.5		1	1.31		0.6	28	44	1.407		0.88	0.82	2.5	2.0	1.8
10		1	2.02		0.6	40	43.5	2.025		1.72	1.67	2.5	4.2	7.1
12.5		1	2.52		0.6	50	46	2.389		2.21	2.27	2.5	5.7	12.5
15		1	2.65		0.6	50	43.5	2.524		2.46	2.59	2.5	6.5	15.9
17.5		1	2.68		0.6	50	37.5	2.923		2.72	2.67	2.5	6.7	18.1
20		1	2.60		0.6	60	47	2.800		2.86	2.64	2.5	6.6	18.9
22.5		1	2.42		0.6	55	42	2.872		2.84	2.51	2.5	6.3	17.8
25		1	2.40		0.6	60	42	3.130		3.00	2.41	2.5	6.0	18.1
27.5		1	2.35		0.6	60	43	3.058		3.09	2.38	2.5	5.9	18.4
30		1	2.28		0.6	60	44	2.989		3.02	2.32	2.5	5.8	17.5
35		1	2.15		0.6	60	43.5	3.023		3.01	2.22	5	11.1	33.3
40		1	2.05		0.6	60	45.5	2.892		2.96	2.10	5	10.5	31.1
45		1	1.97		0.6	60	45.25	2.907		2.90	2.01	5	10.1	29.1
50		1	1.98		0.6	50	41.5	2.644		2.78	1.98	5	9.9	27.4
55		1	1.92		0.6	50	40	2.743		2.69	1.95	5	9.8	26.3
60		1	1.83		0.6	60	44.5	2.956		2.85	1.88	5	9.4	26.7
65	5	0.996	1.85		0.6	55	42	2.872		2.91	1.84	5	9.2	26.7
70	5	0.996	1.80		0.6	60	45	2.923		2.90	1.83	5	9.1	26.3
75	5	0.996	1.92		0.6	55	43.5	2.774		2.85	1.86	5	9.3	26.4
80		1	1.95		0.6	55	42	2.872		2.82	1.94	5	9.7	27.3
85		1	1.93		0.6	70	48	3.195		3.03	1.94	5	9.7	29.4
90		1	1.90		0.6	55	41	2.941		3.07	1.92	5	9.6	29.4
95		1	1.95		0.6	60	41	3.206		3.07	1.93	5	9.6	29.6
100		1	1.95		0.6	60	44	2.989		3.10	1.95	5	9.8	30.2
105		1	1.98		0.6	60	42	3.130		3.06	1.97	5	9.8	30.1
110		1	1.95		0.6	55	41	2.941		3.04	1.97	5	9.8	29.8
115		1	1.88		0.6	60	43.5	3.023		2.98	1.92	5	9.6	28.6
120	5	0.996	1.90		0.6	50	44.5	2.468		2.75	1.89	5	9.5	25.8
125	2.5	0.999	1.90		0.6	45	40.5	2.441		2.45	1.90	5	9.5	23.3
130		1	1.90		0.6	50	44	2.496		2.47	1.90	5	9.5	23.5
135		1	1.82		0.6	50	44	2.496		2.50	1.86	5	9.3	23.2
140		1	1.68		0.6	45	42.25	2.341		2.42	1.75	5	8.8	21.2
145		1	1.40		0.6	40	42	2.097		2.22	1.54	5	7.7	17.1
150		1	1.20		0.6	35	42	1.837		1.97	1.30	5	6.5	12.8
155		1	1.08		0.6	35	46.5	1.661		1.75	1.14	5	5.7	10.0
160		1	0.80		0.6	25	44	1.259		1.46	0.94	5	4.7	6.9
165		1	0.25					0.420	(est.)	0.84	0.53	5	2.6	2.2
169		1	0.00					0.000	(est.)	0.21	0.13	4	0.5	0.1
												Kanektok River		799.9

Depth		Velocity	
Average	1.97 ft	Average	2.69 ft/sec
Maximum	2.68 ft	Maximum	3.21 ft/sec

Notes: Average depth and average velocity are calculated using data from 7.5 ft through 155 ft, which is approximately 87 percent of stream width. Estimates for a given row apply to point velocity, mean cell velocity, and flow.

Appendix D.1. Quinhagak District commercial salmon harvest and effort by period, 1997.

				Chinook		Sockeye		Coho		Pink		Chum	
Period	Date	Hours	Permits	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE
1	6/13	12	115	6,669	4.83	216	0.16					72	0.05
2	6/16	12	95	6,358	5.58	411	0.36					279	0.24
3	6/19	12	123	6,405	4.34	1,678	1.14					788	0.53
4	6/23	12	67	3,338	4.15	1,623	2.02					1,129	1.40
5	6/26	12	132	3,578	2.26	2,777	1.75					1,199	0.76
6	6/30	12	160	2,541	1.32	9,771	5.09					2,498	1.30
7	7/02	12	178	1,955	0.92	10,007	4.68					2,935	1.37
8	7/04	12	161	1,381	0.71	8,757	4.53					2,839	1.47
9	7/07	12	124	1,042	0.70	6,771	4.55					3,552	2.39
10	7/09	12	153	722	0.39	6,806	3.71					4,638	2.53
11	7/11	12	102	331	0.27	6,236	5.09					3,997	3.27
12	7/14	12	4	26	0.54	279	5.81					134	2.79
13	7/16	12	75	196	0.22	3,315	3.68					2,546	2.83
14	7/18	12	76	190	0.21	3,005	3.29	2	0.00	2	0.00	2,590	2.84
15	7/21	12	65	197	0.25	2,452	3.14	7	0.01	3	0.00	2,503	3.21
16	7/23	12	56	106	0.16	1,370	2.04	36	0.05			2,210	3.29
17	7/25	12	53	78	0.12	974	1.53	62	0.10			1,281	2.01
18	7/28	12	47	45	0.08	645	1.14	71	0.13			714	1.27
19	7/30	12	46	78	0.14	483	0.88	335	0.61			718	1.30
20	8/01	12	14	28	0.17	331	1.97	389	2.32			359	2.14
21	8/04	12	58	59	0.08	442	0.64	1,946	2.80			652	0.94
22	8/06	12	54	58	0.09	321	0.50	1,589	2.45			381	0.59
23	8/08	12	53	23	0.04	176	0.28	1,602	2.52			134	0.21
24	8/13	12	62	31	0.04	205	0.28	4,382	5.89			100	0.13
25	8/15	12	70	27	0.03	166	0.20	5,095	6.07			106	0.13
26	8/18	12	56	13	0.02	66	0.10	6,931	10.31			28	0.04
27	8/20	12	61	10	0.01	97	0.13	5,551	7.58			26	0.04
28	8/22	12	62	11	0.01	75	0.10	2,493	3.35			12	0.02
29	8/25	12	47	9	0.02	50	0.09	1,036	1.84			13	0.02
30	8/28	12	35	5	0.01	57	0.14	1,335	3.18			12	0.03
31	9/03	12	0	*No Buyer*									
Total		372	289	35,510		69,562		32,862		5		38,445	

Appendix D.2. Historical commercial salmon harvest in Quinhagak District, 1960 - 1997.

Year	Permits[a]	Chinook	Sockeye	Chum	Pink	Coho	Total
1960		0	5,649	0	0	3,000	8,649
1961		4,328	2,308	18,864	90	46	25,636
1962		5,526	10,313	45,707	4,340	0	65,886
1963		6,555	0	0	0	0	6,555
1964		4,081	13,422	707	939	379	19,528
1965		2,976	1,886	4,242	0	0	9,104
1966		278	1,030	2,610	268	0	4,186
1967		0	652	8,087	0	1926	10,665
1968		8,879	5,884	19,497	75,818	21,511	131,589
1969		16,802	3,784	38,206	953	15,077	74,822
1970	88	18,269	5,393	46,556	15,195	16,850	102,263
1971	61	4,185	3,118	30,208	13	2,982	40,506
1972	107	15,880	3,286	17,247	1,878	376	38,667
1973	109	14,993	2,783	19,680	277	16,515	54,248
1974	196	8,704	19,510	15,298	43,642	10,979	98,133
1975	127	3,928	8,584	35,233	486	10,742	58,973
1976	181	14,110	6,090	43,659	31,412	13,777	109,048
1977	258	19,090	5,519	43,707	202	9,028	77,546
1978	200	12,335	7,589	24,798	47,033	20,114	111,869
1979	206	11,144	18,828	25,995	295	47,525	103,787
1980	169	10,387	13,221	65,984	21,671	62,610	173,873
1981	186	24,524	17,292	53,334	160	47,551	142,861
1982	117	22,106	25,685	34,346	11,838	73,652	167,627
1983	226	46,385	10,263	23,090	168	32,442	112,348
1984	263	33,663	17,255	50,422	16,249	132,151	249,740
1985	300	30,401	7,876	20,418	28	29,992	88,715
1986	324	22,835	21,484	29,700	8,700	57,544	140,263
1987	310	26,022	6,489	8,557	66	50,070	91,204
1988	288	13,883	21,556	29,220	21,258	68,605	154,522
1989	227	20,820	20,582	39,395	273	44,607	125,677
1990	390	27,644	83,681	47,717	12,056	26,926	198,024
1991	346	9,480	53,657	54,493	115	42,571	160,316
1992	349	17,197	60,929	73,383	64,217	86,404	302,130
1993	409	15,784	80,934	40,943	7	55,817	193,485
1994	308	8,564	72,314	61,301	35,904	83,912	261,995
1995	382	38,584	68,194	81,462	186	66,203	254,629
1996	218	14,165	57,665	83,005 [b]	20	118,718	273,573
1997	289	35,510	69,562	38,445	5	32,862	176,384
10-Year Average (1987-1996)	323	19,214	52,600	51,948	129 [c]	64,383	201,556

[a] Number of permit holders that fished at least once during the season. Information not available prior to 1970.

[b] Includes an estimated number of chum caught for roe-only sales.

[c] Odd years only.

Appendix E.1. Age and sex composition of Quinhagak District chinook salmon commercial catch, 1997.

		Brood Year and Age Group					
		1994	1993		1992	1991	1990
		1.1	1.2	2.1	1.3	1.4	1.5
Stratum Dates:	6/13, 6/16, 6/19						
Sampling Dates:	6/13						
Sample Size:	181						
Male	Percent of Sample	0.6	36.5		9.4	18.8	
	Number in Catch	107	7,086		1,825	3,650	
Female	Percent of Sample		0.5		2.2	30.9	1.1
	Number in Catch		107		430	6,012	215
Total	Percent of Sample	0.6	37.0		11.6	49.7	1.1
	Number in Catch	107	7,193		2,255	9,662	215
Stratum Dates:	6/23, 6/26, 6/30						
Sampling Dates:	6/26						
Sample Size:	156						
Male	Percent of Sample	1.3	34.6		14.7	20.5	
	Number in Catch	121	3,274		1,394	1,940	
Female	Percent of Sample				1.3	27.6	
	Number in Catch				121	2,607	
Total	Percent of Sample	1.3	34.6		16.0	48.1	
	Number in Catch	121	3,274		1,515	4,547	
Stratum Dates:	7/02, 7/04, 7/07, 7/09, 7/11						
Sampling Dates:	7/04						
Sample Size:	105						
Male	Percent of Sample	1.0	28.6		4.8	18.1	
	Number in Catch	52	1,552		259	983	
Female	Percent of Sample				1.9	45.7	
	Number in Catch				103	2,482	
Total	Percent of Sample	1.0	28.6		6.7	63.8	
	Number in Catch	52	1,552		362	3,465	
Stratum Dates:	7/14, 7/16, 7/18, 7/21, 7/23						
Sampling Dates:	7/21						
Sample Size:	97						
Male	Percent of Sample	6.2	33.0	1.0	3.1	8.2	1.0
	Number in Catch	44	236	7	22	59	7
Female	Percent of Sample				1.0	46.4	
	Number in Catch				7	332	
Total	Percent of Sample	6.2	33.0	1.0	4.1	54.6	1.0
	Number in Catch	44	236	7	29	391	7

-Continued-

Appendix E.1. (page 2 of 2).

		Brood Year and Age Group					
		1994	1993		1992	1991	1990
		1.1	1.2	2.1	1.3	1.4	1.5
Stratum Dates:	7/25-8/28						
Sampling Dates:	7/25						
Sample Size:	34						
Male	Percent of Sample	14.7	52.9	2.9	17.6	5.9	
	Number in Catch	70	251	14	84	28	
Female	Percent of Sample					5.9	
	Number in Catch					28	
Total	Percent of Sample	14.7	52.9	2.9	17.6	11.8	
	Number in Catch	70	251	14	84	56	
Stratum Dates:	Season						
Sample Size:	573						
Male	Percent of Sample	1.1	34.9	0.1	10.1	18.7	0.0
	Number in Catch	394	12,399	21	3,584	6,660	7
Female	Percent of Sample		0.3		1.9	32.3	0.6
	Number in Catch		107		661	11,461	215
Total	Percent of Sample	1.1	35.2	0.1	12.0	51.0	0.6
	Number in Catch	394	12,506	21	4,245	18,121	222

Appendix E.2. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Quinhagak District chinook salmon commercial catch samples, 1997.

		Brood Year and Age Group					
		1994	1993		1992	1991	1990
		1.1	1.2	2.1	1.3	1.4	1.5
Stratum Dates:	6/13-6/19						
Sample Size:	181						
Male	Mean Length	375	562		712		
	Std. Error	-	6		12		
	Range	375-375	445-664		630-790		
	Sample Size	1	66		17	34 [a]	
Female	Mean Length		636		762		
	Std. Error		-		17		
	Range		636-636		728-806		
	Sample Size		1		4	56 [a]	2 [a]
Stratum Dates:	6/23-6/30						
Sample Size:	156						
Male	Mean Length	393	592		715	843	
	Std. Error	14	8		14	15	
	Range	379-407	490-805		534-825	648-989	
	Sample Size	2	54		23	32	
Female	Mean Length				856	876	
	Std. Error				28	9	
	Range				828-883	651-982	
	Sample Size				2	43	
Stratum Dates:	7/02-7/11						
Sample Size:	105						
Male	Mean Length	448	563		733	865	
	Std. Error	-	8		17	19	
	Range	448-448	486-666		695-783	700-990	
	Sample Size	1	30		5	19	
Female	Mean Length				869	898	
	Std. Error				95	8	
	Range				774-963	746-1000	
	Sample Size				2	48	
Stratum Dates:	7/14-7/23						
Sample Size:	97						
Male	Mean Length	425	580	495	681	915	985
	Std. Error	24	12	-	33	21	-
	Range	365-513	472-701	495-495	621-735	839-1015	985-985
	Sample Size	6	32	1	3	8	1
Female	Mean Length				740	895	
	Std. Error				-	8	
	Range				740-740	794-1012	
	Sample Size				1	45	

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Appendix E.2. (page 2 of 2).

		Brood Year and Age Group					
		1994	1993		1992	1991	1990
		1.1	1.2	2.1	1.3	1.4	1.5
Stratum Dates:	7/25-8/28						
Sample Size:	34						
Male	Mean Length	385	568	458	655	843	
	Std. Error	20	15	-	19	23	
	Range	340-437	480-664	458-458	567-700	820-865	
	Sample Size	5	18	1	6	2	
Female	Mean Length					831	
	Std. Error					21	
	Range					810-852	
	Sample Size					2	
Stratum Dates:	Season [b]						
Sample Size:	573						
Male	Mean Length	398	570	471	713	847	985
	Range	340-513	445-805	458-495	534-825	648-1015	985-985
	Sample Size	15	200	2	54	61	1
Female	Mean Length		636		795	881	
	Range		636-636		728-963	651-1012	
	Sample Size		1		9	138	

[a] Age-1.4 and -1.5 collected on 13 June were omitted from length analysis due to recording errors.

[b] Season mean lengths were weighted by the commercial harvest in each stratum.

Appendix E.3. Age and sex composition of Quinhagak District sockeye salmon commercial catch, 1997.

		Brood Year and Age Group[a]							
		1994	1993		1992			1991	
		0.2	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	6/13, 6/16, 6/19								
Sampling Dates:	6/19								
Sample Size:	155								
Male	Percent of Sample		1.3	5.2	0.7	31.6	1.3	3.2	2.6
	Number in Catch		30	119	15	729	30	74	59
Female	Percent of Sample		2.6	4.5	1.9	33.6		6.5	5.1
	Number in Catch		59	104	44	773		149	119
Total	Percent of Sample		3.9	9.7	2.6	65.2	1.3	9.7	7.7
	Number in Catch		89	223	59	1,502	30	223	178
Stratum Dates:	6/23, 6/26, 6/30								
Sampling Dates:	6/26								
Sample Size:	185								
Male	Percent of Sample		3.2	5.4	0.5	27.6	1.6	5.4	4.3
	Number in Catch		460	766	77	3,906	230	766	613
Female	Percent of Sample		2.7	6.5	1.1	28.6	1.1	7.6	4.3
	Number in Catch		383	919	153	4,060	153	1,072	613
Total	Percent of Sample		5.9	11.9	1.6	56.2	2.7	13.0	8.6
	Number in Catch		843	1,685	230	7,966	383	1,838	1,226
Stratum Dates:	7/02, 7/04, 7/07								
Sampling Dates:	7/04								
Sample Size:	97								
Male	Percent of Sample		1.1	3.1	2.1	33.0		8.2	4.1
	Number in Catch		263	790	527	8,424		2,106	1,053
Female	Percent of Sample		1.0	1.0	2.0	35.0	1.0	3.1	5.2
	Number in Catch		263	263	526	8,950	263	790	1,316
Total	Percent of Sample		2.1	4.1	4.1	68.0	1.0	11.3	9.3
	Number in Catch		526	1,053	1,053	17,374	263	2,896	2,369
Stratum Dates:	7/09, 7/11, 7/14								
Sampling Dates:	7/11								
Sample Size:	176								
Male	Percent of Sample		1.2	14.8	1.1	25.0	0.6	4.0	3.4
	Number in Catch		152	1,968	151	3,331	76	530	454
Female	Percent of Sample	0.6	1.1	10.2	2.9	25.0		5.1	5.1
	Number in Catch	76	151	1,362	379	3,330		681	681
Total	Percent of Sample	0.6	2.3	25.0	4.0	50.0	0.6	9.1	8.5
	Number in Catch	76	303	3,330	530	6,661	76	1,211	1,135

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Appendix E.3. (page 2 of 2).

		Brood Year and Age Group [a]							
		1994	1993		1992			1991	
		0.2	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	7/16, 7/18, 7/21								
Sampling Dates:	7/18								
Sample Size:	178								
Male	Percent of Sample		1.1	19.7	1.1	16.8		2.8	3.9
	Number in Catch		99	1,725	98	1,478		247	345
Female	Percent of Sample	0.6	1.1	19.6	3.4	19.7	1.1	4.5	4.5
	Number in Catch	49	98	1,725	296	1,725	99	394	394
Total	Percent of Sample	0.6	2.2	39.3	4.5	36.5	1.1	7.3	8.4
	Number in Catch	49	197	3,450	394	3,203	99	641	739
Stratum Dates:	7/23, 7/25, 7/28, 7/30, 8/1, 8/4, 8/6, 8/8, 8/13, 8/15, 8/18, 8/20, 8/22, 8/25, 8/28								
Sampling Dates:	7/25								
Sample Size:	161								
Male	Percent of Sample		0.6	18.6		18.7		1.9	3.1
	Number in Catch		34	1,017		1,017		102	169
Female	Percent of Sample		3.7	31.1	1.2	12.4	0.6	6.2	1.9
	Number in Catch		203	1,695	68	678	34	339	102
Total	Percent of Sample		4.3	49.7	1.2	31.1	0.6	8.1	5.0
	Number in Catch		237	2,712	68	1,695	34	441	271
Stratum Dates:	Season [b]								
Sample Size:	952								
Male	Percent of Sample		1.5	9.2	1.3	27.1	0.5	5.5	3.9
	Number in Catch		1,036	6,384	868	18,885	335	3,824	2,694
Female	Percent of Sample	0.2	1.7	8.7	2.1	28.1	0.8	4.9	4.6
	Number in Catch	125	1,159	6,069	1,466	19,516	549	3,426	3,225
Total	Percent of Sample	0.2	3.2	17.9	3.4	55.2	1.3	10.4	8.5
	Number in Catch	125	2,195	12,453	2,334	38,401	884	7,250	5,919

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums a attributed to rounding.

[b] The number of fish in "Season" summaries are the stratum sums; "Season" percentages are derived from the sums.

Appendix E.4. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Quinhagak District sockeye salmon commercial catch samples, 1997.

		Brood Year and Age Group							
		1994	1993		1992			1991	
		0.2	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	6/13, 6/16, 6/19								
Sample Size:	155								
Male	Mean Length		566	513	626	597	502	622	610
	Std. Error		21	19	-	4	3	11	7
	Range		545-586	432-583	626-626	514-641	499-505	585-643	592-626
	Sample Size		2	8	1	49	2	5	4
Female	Mean Length		553	525	597	562		601	558
	Std. Error		9	8	5	3		6	6
	Range		530-570	495-555	591-607	505-618		561-631	533-580
	Sample Size		4	7	3	52		10	8
Stratum Dates:	6/23, 6/26, 6/30								
Sample Size:	185								
Male	Mean Length		610	535	645	598	577	632	602
	Std. Error		11	10	-	3	2	11	8
	Range		582-656	484-580	645-645	535-659	574-582	567-688	556-623
	Sample Size		6	10	1	51	3	10	8
Female	Mean Length		557	533	586	560	543	588	560
	Std. Error		10	9	14	4	20	6	9
	Range		537-593	468-573	572-600	490-617	523-563	553-616	528-610
	Sample Size		5	12	2	53	2	14	8
Stratum Dates:	7/02, 7/04, 7/07								
Sample Size:	97								
Male	Mean Length		555	555	631	590		606	593
	Std. Error		-	4	4	3		9	16
	Range		555-555	550-562	627-635	556-636		564-646	545-615
	Sample Size		1	3	2	32		8	4
Female	Mean Length		577	496	588	554	520	579	562
	Std. Error		-	-	17	4	-	13	12
	Range		577-577	496-496	571-605	505-585	520-520	556-600	530-596
	Sample Size		1	1	2	34	1	3	5
Stratum Dates:	7/09, 7/11, 7/14								
Sample Size:	176								
Male	Mean Length		578	544	638	587	570	634	586
	Std. Error		11	4	10	3	-	12	8
	Range		567-588	507-588	628-648	552-641	570-570	580-684	562-607
	Sample Size		2	26	2	44	1	7	6
Female	Mean Length	480	545	513	578	550		589	552
	Std. Error	-	35	7	11	4		7	5
	Range	480-480	510-580	453-587	537-599	487-595		555-618	532-573
	Sample Size	1	2	18	5	44		9	9

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Appendix E.4. (page 2 of 2).

		Brood Year and Age Group							
		1994	1993		1992			1991	
		0.2	0.3	1.2	0.4	1.3	2.2	1.4	2.3
Stratum Dates:	7/16, 7/18, 7/21								
Sample Size:	178								
Male	Mean Length		577	531	629	588		614	585
	Std. Error		19	4	15	3		11	8
	Range		558-595	473-581	614-644	545-619		593-641	545-600
	Sample Size		2	35	2	30		5	7
Female	Mean Length	502	518	502	571	550	527	572	567
	Std. Error	-	3	3	6	3	13	4	8
	Range	02-502	515-520	467-540	554-585	520-596	514-540	550-588	520-598
	Sample Size	1	2	35	6	35	2	8	8
Stratum Dates:	7/23, 7/25, 7/28, 7/30, 8/1, 8/4, 8/6, 8/8, 8/13, 8/15, 8/18, 8/20, 8/22, 8/25, 8/28								
Sample Size:	161								
Male	Mean Length		528	513		578		565	553
	Std. Error		-	5		4		18	5
	Range		528-528	465-596		520-617		545-601	543-571
	Sample Size		1	30		30		3	5
Female	Mean Length		519	487	570	535	488	553	522
	Std. Error		8	3	17	7	-	8	21
	Range		489-548	456-526	553-586	474-577	488-488	504-587	483-553
	Sample Size		6	50	2	20	1	10	3
Stratum Dates:	Season [a]								
Sample Size:	952								
Male	Mean Length		584	536	633	590	569	615	591
	Range		528-656	432-596	614-648	514-659	499-582	545-688	543-626
	Sample Size		14	112	8	236	6	38	34
Female	Mean Length	489	550	505	581	554	526	581	559
	Range	480-502	489-593	453-587	537-607	474-618	488-563	504-631	483-610
	Sample Size	2	20	123	20	238	6	54	41

[a] Season mean lengths are weighted by the commercial harvest in each stratum.

Appendix E.5. Age and sex composition of Quinhagak District chum salmon commercial catch, 1997.

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	6/13, 6/16, 6/19				
Sampling Dates:	6/19				
Sample Size:	170				
Male	Percent of Sample		7.1	44.7	0.6
	Number in Catch		81	509	7
Female	Percent of Sample		5.3	42.4	
	Number in Catch		60	483	
Total	Percent of Sample		12.4	87.1	0.6
	Number in Catch		141	992	7
Stratum Dates:	6/23, 6/26, 6/30				
Sampling Dates:	6/26				
Sample Size:	169				
Male	Percent of Sample		9.5	39.7	0.6
	Number in Catch		457	1,913	29
Female	Percent of Sample		7.7	42.0	0.6
	Number in Catch		371	2,028	28
Total	Percent of Sample		17.2	81.7	1.2
	Number in Catch		828	3,941	57
Stratum Dates:	7/02, 7/04, 7/07, 7/09				
Sampling Dates:	7/07				
Sample Size:	191				
Male	Percent of Sample	0.5	14.1	31.9	0.5
	Number in Catch	73	1,974	4,460	73
Female	Percent of Sample		16.8	35.6	0.5
	Number in Catch		2,339	4,971	73
Total	Percent of Sample	0.5	30.9	67.5	1.0
	Number in Catch	73	4,313	9,431	146
Stratum Dates:	7/11, 7/14				
Sampling Dates:	7/11				
Sample Size:	197				
Male	Percent of Sample	1.5	20.3	18.3	2.6
	Number in Catch	63	839	755	105
Female	Percent of Sample		25.9	30.4	1.0
	Number in Catch		1,069	1,258	42
Total	Percent of Sample	1.5	46.2	48.7	3.6
	Number in Catch	63	1,908	2,013	147

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Appendix E.5. (page 2 of 2).

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	7/16, 7/18, 7/21				
Sampling Dates:	7/18				
Sample Size:	198				
Male	Percent of Sample	0.5	21.2	22.7	
	Number in Catch	39	1,620	1,736	
Female	Percent of Sample	0.5	24.3	30.8	
	Number in Catch	38	1,852	2,354	
Total	Percent of Sample	1.0	45.5	53.5	
	Number in Catch	77	3,472	4,090	
Stratum Dates:	7/23, 7/25, 7/28, 7/30				
Sampling Dates:	7/25				
Sample Size:	143				
Male	Percent of Sample	3.5	23.8	16.8	0.7
	Number in Catch	172	1,171	826	35
Female	Percent of Sample	2.1	33.5	18.9	0.7
	Number in Catch	103	1,652	930	34
Total	Percent of Sample	5.6	57.3	35.7	1.4
	Number in Catch	275	2,823	1,756	69
Stratum Dates:	8/01-8/28				
Sampling Dates:	8/06				
Sample Size:	153				
Male	Percent of Sample	1.3	19.6	11.8	
	Number in Catch	24	357	214	
Female	Percent of Sample	2.6	30.7	33.3	0.7
	Number in Catch	47	560	608	12
Total	Percent of Sample	3.9	50.3	45.1	0.7
	Number in Catch	71	917	822	12
Stratum Dates:	Season				
Sample Size:	1,221				
Male	Percent of Sample	1.0	16.9	27.1	0.6
	Number in Catch	371	6,498	10,414	248
Female	Percent of Sample	0.5	20.6	32.8	0.5
	Number in Catch	189	7,905	12,630	190
Total	Percent of Sample	1.5	37.5	59.9	1.1
	Number in Catch	560	14,403	23,044	438

Appendix E.6. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Quinhagak District chum salmon commercial catch samples, 1997.

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	6/13, 6/16, 6/19				
Sample Size:	170				
Male	Mean Length		609	629	694
	Std. Error		9	3	-
	Range		549-664	548-691	694-694
	Sample Size		12	76	1
Female	Mean Length		584	595	
	Std. Error		7	3	
	Range		558-618	533-655	
	Sample Size		9	72	
Stratum Dates:	6/23, 6/26, 6/30				
Sample Size:	169				
Male	Mean Length		584	620	623
	Std. Error		5	4	-
	Range		554-627	521-698	623-623
	Sample Size		16	67	1
Female	Mean Length		580	587	580
	Std. Error		11	3	-
	Range		537-683	532-641	580-580
	Sample Size		13	70	1
Stratum Dates:	7/02, 7/04, 7/07, 7/09				
Sample Size:	191				
Male	Mean Length	537	592	612	610
	Std. Error	-	6	4	-
	Range	537-537	525-650	545-680	610-610
	Sample Size	1	27	61	1
Female	Mean Length		562	590	568
	Std. Error		5	3	-
	Range		510-628	531-692	568-568
	Sample Size		32	68	1
Stratum Dates:	7/11, 7/14				
Sample Size:	197				
Male	Mean Length	537	568	603	615
	Std. Error	8	4	6	10
	Range	537-551	514-628	512-677	604-655
	Sample Size	3	40	36	5
Female	Mean Length		549	580	581
	Std. Error		3	3	18
	Range		497-590	532-643	563-598
	Sample Size		51	60	2

-Continued-

Appendix E.6. (page 2 of 2).

		Brood Year and Age Group			
		1994	1993	1992	1991
		0.2	0.3	0.4	0.5
Stratum Dates:	7/16, 7/18, 7/21				
Sample Size:	198				
Male	Mean Length	517	569	602	
	Std. Error	-	3	4	
	Range	517-517	519-623	502-658	
	Sample Size	1	42	45	
Female	Mean Length	542	562	578	
	Std. Error	-	4	3	
	Range	542-542	501-608	522-635	
	Sample Size	1	48	61	
Stratum Dates:	7/23, 7/25, 7/28, 7/30				
Sample Size:	143				
Male	Mean Length	494	559	582	573
	Std. Error	15	5	6	-
	Range	464-531	500-666	531-635	573-573
	Sample Size	5	34	24	1
Female	Mean Length	516	542	556	551
	Std. Error	16	3	5	-
	Range	488-545	498-596	521-612	551-551
	Sample Size	3	48	27	1
Stratum Dates:	8/01-8/28				
Sample Size:	153				
Male	Mean Length	511	569	603	
	Std. Error	6	6	9	
	Range	505-517	512-629	528-662	
	Sample Size	2	30	18	
Female	Mean Length	530	538	557	590
	Std. Error	10	4	4	-
	Range	511-549	480-599	495-616	590-590
	Sample Size	4	47	51	1
Stratum Dates:	Season				
Sample Size:	1,221				
Male	Mean Length	513	576	610	611
	Range	464-551	500-666	502-698	573-694
	Sample Size	12	201	327	9
Female	Mean Length	525	555	582	571
	Range	488-549	480-683	495-692	551-598
	Sample Size	8	248	409	6

Appendix E.7. Age and sex composition of Quinhagak District coho salmon commercial catch, 1997.

		Brood Year and Age Group [a]			
		1994	1993	1992	
		1.1	2.1	3.1	Total
Stratum Dates:	7/18, 7/21, 7/23, 7/25, 7/28, 7/30, 8/1, 8/4, 8/6, 8/8				
Sampling Dates:	8/6				
Sample Size:	85				
Male	Percent of Sample	8.2	47.1	2.4	57.6
	Number in Catch	495	2,844	145	3,478
Female	Percent of Sample		42.3		42.4
	Number in Catch		2,554		2,561
Total	Percent of Sample	8.2	89.4	2.4	100.0
	Number in Catch	495	5,399	145	6,039
Stratum Dates:	8/13, 8/15				
Sampling Dates:	8/13 [b]				
Sample Size:	200				
Male	Percent of Sample				54.0
	Number in Catch				5,118
Female	Percent of Sample				46.0
	Number in Catch				4,359
Total	Percent of Sample				100.0
	Number in Catch				9,477
Stratum Dates:	8/18, 8/20, 8/22				
Sampling Dates:	8/20				
Sample Size:	146				
Male	Percent of Sample	2.7	42.5	0.7	45.9
	Number in Catch	404	6,364	105	6,874
Female	Percent of Sample	2.1	50.7	1.4	54.1
	Number in Catch	314	7,592	210	8,101
Total	Percent of Sample	4.8	93.2	2.1	100.0
	Number in Catch	719	13,957	314	14,975
Stratum Dates:	8/25				
Sampling Dates:	8/25				
Sample Size:	128				
Male	Percent of Sample	0.9	43.5	1.7	46.1
	Number in Catch	9	450	18	478
Female	Percent of Sample	0.9	52.0	1.0	53.9
	Number in Catch	9	539	10	558
Total	Percent of Sample	1.8	95.5	2.7	100.0
	Number in Catch	19	990	28	1,036

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Appendix E.7. (page 2 of 2).

		Brood Year and Age Group [a]			
		1994	1993	1992	
		1.1	2.1	3.1	Total
Stratum Dates:	8/28				
Sampling Dates:	8/28 [b]				
Sample Size:	117				
Male	Percent of Sample				41.9
	Number in Catch				559
Female	Percent of Sample				58.1
	Number in Catch				776
Total	Percent of Sample				100.0
	Number in Catch				1,335
Stratum Dates:	Season				
Sample Size:	359				
Male	Percent of Sample				50.2
	Number in Catch				16,507
Female	Percent of Sample				49.8
	Number in Catch				16,355
Total	Percent of Sample				100.0
	Number in Catch				32,862

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are due to rounding.

[b] No scales were collected.

Appendix E.8. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Quinhagak District coho salmon commercial catch samples, 1997.

		Brood Year and Age Group		
		1994	1993	1992
		1.1	2.1	3.1
Stratum Dates:	7/18, 7/21, 7/23, 7/25, 7/28, 7/30, 8/1, 8/4, 8/6, 8/8			
Sample Size:	85			
Male	Mean Length	549	568	603
	Std. Error	28	9	33
	Range	414-623	460-665	570-635
	Sample Size	7	40	2
Female	Mean Length		606	
	Std. Error		4	
	Range		548-655	
	Sample Size		36	
Stratum Dates:	8/13, 8/15	All lengths for this stratum are by sex		
Sample Size:	200	only; fish were not aged.		
Male	Mean Length		589	
	Std. Error		5	
	Range		355-679	
	Sample Size		108	
Female	Mean Length		599	
	Std. Error		3	
	Range		529-678	
	Sample Size		92	
Stratum Dates:	8/18, 8/20, 8/22			
Sample Size:	146			
Male	Mean Length	646	609	635
	Std. Error	18	5	-
	Range	607-695	490-673	635-635
	Sample Size	4	62	1
Female	Mean Length	610	611	627
	Std. Error	14	4	26
	Range	584-631	472-668	601-652
	Sample Size	3	74	2
Stratum Dates:	8/25			
Sample Size:	128			
Male	Mean Length	625	603	546
	Std. Error	-	8	4
	Range	625-625	430-681	542-550
	Sample Size	1	50	2
Female	Mean Length	622	601	573
	Std. Error	-	4	-
	Range	622-622	505-662	573-573
	Sample Size	1	56	1

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		Brood Year and Age Group		
		1994	1993	1992
		1.1	2.1	3.1
Stratum Dates:	8/28	All lengths for this stratum are by sex only; fish were not aged.		
Sample Size:	117			
Male	Mean Length		616	
	Std. Error		6	
	Range		486-689	
	Sample Size		49	
Female	Mean Length		612	
	Std. Error		4	
	Range		552-694	
	Sample Size		68	

Appendix F.1. Kanektok River counting tower project escapement estimates, 1960 - 1962.

Dates of Estimate [a]	Red	Expanded Estimate [b]	Chum
29 June - 5 August 1960	35,921		64,355
14 July - 14 August 1961	19,286	24,612 [c]	
15 July - 14 August 1962	15,492	18,564	

[a] In 1960 the tower was located approximately 6 miles above the mouth of the Kanektok River. Red and chum salmon were observed from 29 June until project termination on 5 August. On 3 August, 1960 Dean Paddock, ADF&G biologist from Bristol Bay, estimated 100,000 reds in Kagati Lake. In 1961 and 1962 the tower was located at the outlet of Kagati Lake.

[b] In 1960 no expanded estimate was attempted. The counts for that year were an estimate for only 32% of the total hours between 29 June and 5 August. In 1961 an average of 18.32 hours per day were counted and in 1962 an average of 16.49 hours were counted and the expanded estimate is for 24 hours.

[c] The 1962 Kanektok tower report determined this number to be overestimated and estimated the actual escapement to be between 21 and 22 thousand red salmon.

Appendix F.2. Kanektok River sonar project estimated daily escapement, 1982.

Date [a]	King	Red	Chum	Pink	Coho
20-Jun	408	129	179		
21-Jun	287	91	125		
22-Jun	222	71	97		
23-Jun	464	232	248		
24-Jun	902	452	481		
25-Jun	1,291	648	689		
26-Jun	2,220	654	575		
27-Jun	2,782	820	721		
28-Jun	2,507	739	649		
29-Jun	1,590	468	411		
30-Jun	603	802	1,033	3	
01-Jul	629	836	1,078	3	
02-Jul	493	654	844	3	
03-Jul	350	634	573		
04-Jul	513	929	842		
05-Jul	504	913	827		
06-Jul	497	901	817		
07-Jul	154	493	305		
08-Jul	308	987	613		
09-Jul	410	1,080	1,053	431	
10-Jul	242	636	621	254	
11-Jul	94	323	405	161	
12-Jul	202	691	868	346	
13-Jul	205	702	882	351	
14-Jul	347	808	1,892	1,218	2
15-Jul	676	1,574	3,684	2,372	5
16-Jul	1,367	2,866	4,183	3,026	7
17-Jul	745	1,563	2,281	1,651	4
18-Jul	1,087	2,643	4,485	1,249	26
19-Jul	1,544	3,754	6,369	1,773	36
20-Jul	605	1,471	2,493	695	14
21-Jul	334	1,227	2,393	3,867	13
22-Jul	365	1,341	2,617	4,227	15
23-Jul	171	602	1,530	3,053	307
24-Jul	240	844	2,147	4,285	431
25-Jul	133	506	1,223	4,730	578
26-Jul	176	663	1,602	6,195	757
27-Jul	276	1,053	2,547	9,847	1,205
28-Jul	182	692	1,675	6,473	791
29-Jul	65	248	602	2,325	284
30-Jul	119	215	698	2,869	2,540
31-Jul	123	223	725	2,978	2,637
01-Aug	121	130	271	1,379	2,981
02-Aug	39	42	89	452	977
Total	26,592	37,350	58,442	66,216	13,610

[a] Species composition for the sonar counts was derived from the commercial catch composition.

Appendix F.3. Kanektok River sonar project estimated daily escapement, 1983.

Date [a]	King	Red	Chum	Pink	Coho
13-Jun	97	0	1		
14-Jun	596	0	7		
15-Jun	1,028	1	11		
16-Jun	567	1	6		
17-Jun	322	6	33		
18-Jun	981	19	99		
19-Jun	1,541	29	155		
20-Jun	1,357	26	137		
21-Jun	881	17	88		
22-Jun	1,309	25	132		
23-Jun	1,338	26	134		
24-Jun	913	27	86		
25-Jun	1,251	37	118		
26-Jun	3,317	97	313		
27-Jun	1,081	32	101		
28-Jun	1,070	60	204		
29-Jun	0	0	1,360		
30-Jun	1,484	494	247		
01-Jul	284	1,710	1,426		
02-Jul	2,374	1,052	2,108		
03-Jul	721	1,200	2,643		
04-Jul	589	348	1,716		
05-Jul	1,899	0	4,740		
06-Jul	1,435	2,256	1,029	5	
07-Jul	2,968	1,268	2,968	7	
08-Jul	4,635	1,327	1,327	22	
09-Jul	1,875	1,504	4,882	25	
10-Jul	1,775	3,199	2,847	23	
11-Jul	1,595	1,276	5,103	24	
12-Jul	1,360	1,584	2,945	29	
13-Jul	679	1,223	678	12	
14-Jul	1,141	342	799	11	
15-Jul	1,401	557	1,401	30	
16-Jul	895	384	1,278	23	
17-Jul	1,208	122	1,086	23	
18-Jul	545	148	593	12	
19-Jul	542	678	1,086	32	
20-Jul	1,209	723	1,209	44	
21-Jul	313	388	1,243	28	
22-Jul	178	178	1,427	26	
23-Jul	0	167	1,336	55	
24-Jul	55	18	768	28	3
25-Jul	283	48	1,225	53	5
26-Jul	71	118	945	43	4
27-Jul	127	127	1083	43	4
28-Jul	23	70	772	8	37
Total [b]	49,313	22,912	53,895	606	53

[a] Species composition for the sonar counts from 13 through 28 June was derived from the commercial catch composition and from 29 June through 28 July from the test drift gillnet catch composition.

[b] The text in the 1983 sonar report had an escapement of 49,312 king, and 22,911 red salmon. Also 613 pink and 58 coho salmon were reported in the text based on commercial catch compostion.

Appendix F.4. Kanektok River sonar project estimated daily escapement, 1984.

Date [a]	King	Red	Chum	Pink	Coho
15-Jun	149	0	234		
16-Jun	313	0	311		
17-Jun	378	0	470		
18-Jun	681	131	286		
19-Jun	151	360	434		
20-Jun	528	276	552		
21-Jun	754	372	424		
22-Jun	758	717	129		
23-Jun	907	1,775	456		
24-Jun	1,043	1,043	1,391		
25-Jun	2,232	276	332		
26-Jun	409	747	358		
27-Jun	1,348	3,680	819		
28-Jun	1,760	1,368	1,715		
29-Jun	1,763	1,344	1,998		
30-Jun	1,469	1,557	3,209		
01-Jul	1,282	1,837	3,107		
02-Jul	1,164	1,402	4,057		
03-Jul	1,713	1,322	5,602		
04-Jul	2,375	1,912	7,759		
05-Jul	1,774	1,485	5,781		
06-Jul	995	5,727	5,080		
07-Jul	1,365	3,282	4,289		
08-Jul	674	2,725	3,928	471	
09-Jul	531	2,990	5,416	350	
10-Jul	807	1,849	10,088	225	
11-Jul	660	1,794	6,297	0	
12-Jul	375	1,365	8,364	286	
13-Jul	163	3,200	5,794	172	
14-Jul	697	2,124	8,245	1,006	
15-Jul	112	2,108	6,804	0	
16-Jul	1,319	1,463	3,536	676	
17-Jul	781	596	10,085	300	
18-Jul	522	660	7,717	1,814	
19-Jul	516	588	8,270	590	
20-Jul	411	0	3,928	367	
21-Jul	172	360	7,775	0	
22-Jul	978	0	3,647	6,451	90
23-Jul	1,770	0	0	10,622	0
24-Jul	0	1,098	12,624	6,038	1,647
25-Jul	1,644	0	11,507	1,644	0
26-Jul	141	424	6,932	1,981	2,405
27-Jul	265	0	3,847	1,990	2,919
28-Jul	0	193	4,431	4,431	1,927
29-Jul	394	0	3,940	1,182	2,758
30-Jul	0	0	5,760	0	5,760
31-Jul	0	312	1,247	0	7,792
01-Aug	0	292	1,170	0	7,310
Total [b]	38,243	54,754	200,145	40,596	32,608

[a] Species composition for the sonar counts from 15 June through 21 July was derived from the test drift gillnet catch composition and from 22 July through 1 August from the test beach seine catch composition.

[b] The text in the 1984 sonar report had an escapement of 38,245 king, 200,140 chum, 40,595 pink, and 32,606 coho salmon.

Appendix F.5. Kanektok River sonar project estimated daily escapement, 1985.

Date [a]	King	Red	Chum	Pink	Coho
18-Jun	8				
19-Jun	68				
20-Jun	5				
21-Jun	18		26		
22-Jun	181		0		
23-Jun	559		0		
24-Jun	1,499		0		
25-Jun	1,483		0		
26-Jun	1,828	116	0		
27-Jun	1,885	284	0		
28-Jun	3,254	197	0		
29-Jun	1,383	269	94		
30-Jun	1,397	292	47		
01-Jul	974	217	0		
02-Jul	1,775	138	0		
03-Jul	2,026	137	0		
04-Jul	991	73	0		
05-Jul	1,458	116	0		
06-Jul	1,111	56	176		
07-Jul	737	179	151		
08-Jul	417	246	121		
09-Jul	424	148	216		
10-Jul	550	197	320		
11-Jul	445	276	378		
12-Jul	475	101	632		
13-Jul	443	72	328		
14-Jul	378	94	300		
15-Jul	688	268	607		
16-Jul	513	275	764		
17-Jul	856	540	990		
18-Jul	506	440	556		
19-Jul	640	325	464		
20-Jul	413	142	321		
21-Jul	409	71	269		30
22-Jul	411	38	246		45
23-Jul	588	246	796		180
24-Jul	283	67	977		0
25-Jul	1,247	407	988		0
26-Jul	230	0	1,018		0
27-Jul	788	55	810		0
28-Jul	860	93	1,151		97
29-Jul	543	84	930		135
30-Jul	798	0	1,030		806
31-Jul	212	0	619		583
Total [b]	35,757	6,259	15,325	0	1,876

[a] Species composition for the sonar counts was derived the test drift gillnet catch composition.

[b] The text in the 1985 sonar report had an escapement of 35,755 king salmon.

Appendix F.6. Kanektok River sonar project estimated daily escapement, 1986.

Date [a]	King	Red	Chum	Pink	Coho
16-Jun	521		90		
17-Jun	431		108		
18-Jun	588		78		
19-Jun	402		77		
20-Jun	775		245		
21-Jun	913		631		
22-Jun	896		230		
23-Jun	920		0		
24-Jun	206	547	311		
25-Jun	441	154	562		
26-Jun	290	216	154		
27-Jun	132	160	334		
28-Jun	700	265	898	265	
29-Jun	631	184	411	199	
30-Jun	733	175	204	204	
01-Jul	905	513	278	0	
02-Jul	1,477	306	585	0	
03-Jul	2,028	0	160	0	
04-Jul	1,276	350	241	0	
05-Jul	914	779	385	0	
06-Jul	795	449	232	49	
07-Jul	1,195	379	216	138	
08-Jul	911	105	1,234	603	
09-Jul	1,790	1,370	0	0	
10-Jul	289	0	4,429	4,312	
11-Jul	404	612	722	1,769	
12-Jul	884	560	365	0	
13-Jul	563	258	689	156	
14-Jul	223	0	744	223	
15-Jul	112	117	375	0	62
16-Jul	266	0	1,090	0	58
17-Jul	87	71	764	126	0
18-Jul	224	181	1,965	324	0
Total [b]	22,922	7,751	18,807	8,368	120

[a] Species composition for the sonar counts was derived the test drift gillnet catch composition.

[b] The text in the 1986 sonar report had an escapement of 18,808 chum salmon.

Appendix F.7. Kanektok River sonar project estimated daily escapement, 1987.

Date [a]	King	Red	Chum	Pink	Coho
27-Jun	410				
28-Jun	195				
29-Jun	360	97			
30-Jun	43	11	2		
01-Jul	152	35	17		
02-Jul	130	161	0		
03-Jul	419	0	0		
04-Jul	227	83	0		
05-Jul	184	213	0		
06-Jul	276	167	239		
07-Jul	896	0	0		
08-Jul	825	476	702		
09-Jul	641	556	68		
10-Jul	261	339	851		
11-Jul	323	795	809		
12-Jul	620	538	658		
13-Jul	530	738	814		
14-Jul	269	374	413		
15-Jul	567	789	871		
16-Jul	1,028	1,431	1,580		
17-Jul	905	1,259	1,390		
18-Jul	1,768	2,459	2,715		
Total [b]	11,029	10,521	11,129	0	0

[a] Species composition for the sonar counts was derived the test drift gillnet catch composition.

[b] The text in the 1987 sonar report had an escapement of 11,031 king, 10,520 red, and 11,132 chum salmon.

Appendix G.1. Age, sex, and length (mm measured from mid-orbit to fork-of-tail) of Kanektok River chinook salmon escapement samples, 1984 - 1987.

		Age Group							
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	1.6
Year:	1984								
Capture Method:	Beach Seine								
Sample Size:	49								
Male	Percent	16.3	30.7	26.5	4.1		2.0		
	Mean Length	361	503	692	824		1030		
	Std. Error	18	10	14	17		-		
	Sample Size	8	15	13	2		1		
Female	Percent			4.1	14.3		2.0		
	Mean Length			753	842		834		
	Std. Error			33	31		-		
	Sample Size			2	7		1		
Year:	1984								
Capture Method:	Carcass								
Sample Size:	505								
Male	Percent		2.4	35.2	21.4	0.2	2.0	0.4	
	Sample Size		12	178	108	1	10	2	
Female	Percent			3.8	30.1	0.2	4.3		
	Sample Size			19	152	1	22		
Year:	1985								
Capture Method:	Beach Seine								
Sample Size:	131								
Male	Percent	3.1	16.8	6.9	18.3		0.8		
	Mean Length	399	522	710	893		1010		
	Std. Error	34	20	52	19		-		
	Range	340-460	415-810	455-890	745-1100		1010-1010		
	Sample Size	4	22	9	24		1		
Female	Percent			3.8	48.9		1.5		
	Mean Length			800	874		883		
	Std. Error			44	9		28		
	Range			655-880	580-1100		855-910		
	Sample Size			5	64		2		
Year:	1986								
Capture Method:	Beach Seine								
Sample Size:	31								
Male	Percent	9.7	25.8	35.5	6.5				
	Mean Length	319	532	690	853				
	Std. Error	10	17	23	38				
	Range	308-340	445-590	510-740	685-760				
	Sample Size	3	8	11	2				
Female	Percent			3.2	9.7		9.7		
	Mean Length			690	853		915		
	Std. Error			-	32		36		
	Range			690-690	800-910		855-980		
	Sample Size			1	3		3		

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Appendix G.1. (page 2 of 2).

		Age Group							
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	1.6
Year:	1987								
Capture Method:	Beach Seine								
Sample Size:	381								
Male	Percent	0.5	2.9	10.8	34.6		3.1		
	Mean Length	413	531	741	855		944		
	Std. Error	28	19	13	7		17		
	Range	385-440	462-668	540-890	658-1070		781-1017		
	Sample Size	2	11	41	132		12		
Female	Percent		0.8	3.7	39.4		3.9		0.3
	Mean Length		542	742	860		884		816
	Std. Error		21	22	5		16		-
	Range		500-570	535-860	625-1006		757-990		816-816
	Sample Size		3	14	150		15		1

Appendix G.2. Age, sex, and length (mm measured from mid-orbit to fork-of-tail) of Kanektok River sockeye salmon escapement samples, 1984 - 1987.

		Age Group							
		0.3	1.2	0.4	1.3	2.2	1.4	2.3	2.4
Year:	1984								
Capture Method:	Beach Seine								
Sample Size:	107								
Male	Percent	2.8	5.6		35.5		1.9		0.9
	Mean Length	570	521		594		623		630
	Std. Error	9	6		4		17		-
	Sample Size	3	6		38		2		1
Female	Percent	2.8	9.3		40.3				0.9
	Mean Length	541	525		551				551
	Std. Error	11	9		3				-
	Sample Size	3	10		43				1
Year:	1984								
Capture Method:	Carcass								
Sample Size:	275								
Male	Percent		28.7		36.4	0.7		1.1	
	Sample Size		79		100	2		3	
Female	Percent		7.6		24.0	0.7		0.7	
	Sample Size		21		66	2		2	
Year:	1985								
Capture Method:	Beach Seine								
Sample Size:	12								
Male	Percent			8.3	25.0				
	Mean Length			610	578				
	Std. Error			-	26				
	Range			610-610	530-620				
	Sample Size			1	3				
Female	Percent	16.7	8.3		25.0		16.7		
	Mean Length	543	490		572		593		
	Std. Error	3	-		13		18		
	Range	540-545	490-490		550-595		575-610		
	Sample Size	2	1		3		2		
Year:	1986								
Capture Method:	Beach Seine								
Sample Size:	79								
Male	Percent	8.9	1.3		26.6				
	Mean Length	598	550		595				
	Std. Error	10	-		5				
	Range	565-641	550-550		560-650				
	Sample Size	7	1		21				
Female	Percent	5.1	5.1		48.1	2.5	1.3	1.3	
	Mean Length	544	506		548	483	530	555	
	Std. Error	2	6		5	3	-	-	
	Range	540-550	495-520		445-630	480-485	530-530	555-555	
	Sample Size	4	4		38	2	1	1	

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Appendix G.2. (page 2 of 2).

		Age Group							
		0.3	1.2	0.4	1.3	2.2	1.4	2.3	2.4
Year:	1987								
Capture Method:	Beach Seine								
Sample Size:	295								
Male	Percent	3.4	31.2		11.5	0.7			
	Mean Length	581	529		588	523			
	Std. Error	8	3		7	18			
	Range	545-630	455-640		500-665	505-540			
	Sample Size	10	92		34	2			
Female	Percent	1.7	45.1	0.7	5.8				
	Mean Length	557	499	550	559				
	Std. Error	18	2	40	6				
	Range	00-610	410-570	510-590	500-595				
	Sample Size	5	133	2	17				

Appendix G.3. Age, sex and length (mm measured from mid-orbit to fork-of-tail) of Kanektok River chum salmon escapement samples, 1984 - 1987.

		Age Group				
		0.2	0.3	0.4	0.5	1.4
Year:	1984					
Capture Method:	Beach Seine					
Sample Size:	514					
Male	Percent		32.9	16.9	1.4	0.2
	Mean Length		605	631	642	600
	Std. Error		2	4	12	-
	Sample Size		169	87	7	1
Female	Percent	0.2	34.6	13.6	0.2	
	Mean Length	550	569	592	580	
	Std. Error	-	-	4	-	
	Sample Size	1	178	70	1	
Year:	1984					
Capture Method:	Carcass					
Sample Size:	264					
Male	Percent	0.4	48.5	17.0	0.8	
	Sample Size	1	128	45	2	
Female	Percent		26.5	6.4	0.4	
	Sample Size		70	17	1	
Year:	1985					
Capture Method:	Beach Seine					
Sample Size:	150					
Male	Percent	0.7	26.0	23.3		
	Mean Length	599	600	615		
	Std. Error	-	4	5		
	Range	599-599	540-650	568-669		
	Sample Size	1	39	35		
Female	Percent	0.7	28.0	21.3		
	Mean Length	555	564	598		
	Std. Error	-	8	8		
	Range	555-555	500-850	520-760		
	Sample Size	1	42	32		
Year:	1986					
Capture Method:	Beach Seine					
Sample Size:	287					
Male	Percent	0.3	24.0	31.0	0.3	
	Mean Length	490	590	614	595	
	Std. Error	-	4	3	-	
	Range	490-490	530-715	500-700	595-595	
	Sample Size	1	69	89	1	
Female	Percent		22.0	21.6	0.7	
	Mean Length		558	575	585	
	Std. Error		3	4	-	
	Range		505-620	505-635	585-585	
	Sample Size		63	62	2	

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Appendix G.3. (page 2 of 2).

		Age Group				
		0.2	0.3	0.4	0.5	1.4
Year:	1987					
Capture Method:	Beach Seine					
Sample Size:	150					
Male	Percent		14.0	32.0	2.0	
	Mean Length		577	603	587	
	Std. Error		9	5	8	
	Range		510-665	515-675	570-595	
	Sample Size		21	48	3	
Female	Percent		22.0	30.0		
	Mean Length		547	573		
	Std. Error		7	6		
	Range		485-650	510-690		
	Sample Size		33	45		